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CONSTANT TEMPERATURE CONTROLLED EQUIPMENT

for the SCIENTIFIC AND LABORATORY FIELD

ELECTRIC OVENS
BATHS
REFRIGERATED UNITS
ENVIRONMENTAL CHAMBERS
INCUBATORS
FURNACES

CATALOG SL-181

BLUE M

CONSTANT TEMPERATURE CONTROLLED EQUIPMENT

Products Designed and Manufactured

by

BLUE M Electric Company

CORPORATE HEADQUARTERS **BLUE ISLAND, ILLINOIS, 60406**

Area Code 312; Phones: 385-9000 468-7755

TWX 910-689-3398

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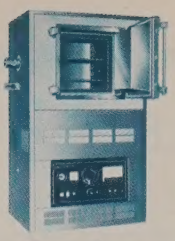
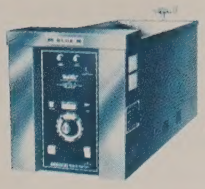
PRINTED IN U.S.A.



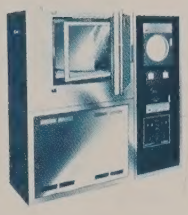
OVENS

OVENS/INCUBATORS
By far America's most complete line. Hundreds of models-from simple bench type gravity units on up to large floor models with proportional controls. Temperatures to +704°C. Include Batch, Vacuum, Aging, Drying — plus FRICTION-AIRE™ the patented electric chambers with NO heating elements.



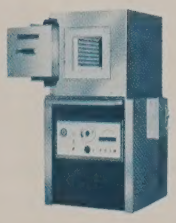
BATHS

BATHS/COOLING UNITS
Water, oil, refrigerated . . . dozens of proven models . . . Shaker, Hydrometer, Full Visibility Jar, Tissue Flotation. Temperatures from 0°C. to +260°C. Most feature patented MAGNI-WHIRL® agitation. Portable Cooling Units let you chill liquids to as low as −40°C. almost anywhere. You can't buy better!



ENVIRONMENTAL

ENVIRONMENTAL CHAMBERS
Acknowledged as the finest chambers ever built for controlling temperature and humidity simultaneously. Designed for testing to MIL and even tougher in-house specs. Include economical jar type units, exclusive air-cooled models, steady state constant temperature/humidity chambers.

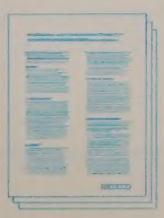


FURNACES

FURNACES
Dozens of advanced models . . . bench and floor type . . . temperatures to +1620°C. Budget models redesigned: bring modern appearance, greater safety within reach of any laboratory. Tube, Crucible and Dental models — plus STABIL-O-GLOW® and RAD-O-GLOW Globar® Furnaces with patented POWER-O-MATIC 80® Control for superb performance.

ACCESSORIES

ACCESSORIES
A variety of quality products to extend the scope or provide an added dimension of operational flexibility to the standard equipment in this catalog. Built by Blue M or built to Blue M's rigid specifications by other leading manufacturers to assure performance equal to the chambers proper.



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TECHNICAL DATA
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BLUE M

WHERE IMAGINATION AND QUALITY JOIN TO ASSURE YOU OF RELIABILITY AND SERVICE

Imagination—in the form of new products and product improvements—continues to earmark Blue M equipment. New equipment to meet new requirements . . . improved equipment to perform existing jobs better—these are basic Blue M goals. The many significant equipment developments detailed in this catalog are a measure of our success in meeting them.

To the potential user of scientific and laboratory equipment, this broader, more versatile range of units means you have a better chance of finding just the facility you need. And not just any unit, but a piece of equipment that is designed, engineered and built to be the finest of its kind on the market.

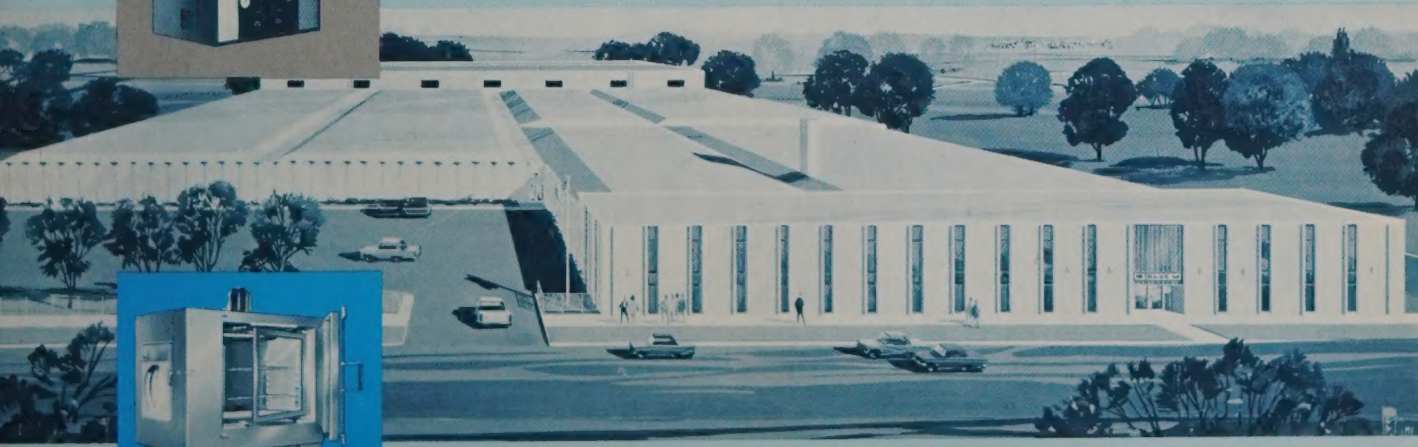
No one knows better than Blue M that a laboratory, pilot plant or production procedure can be no more reliable than the equipment performing it. Hence, our concern is not only that every unit is tailored to specific kinds of work, but that it will deliver year-in, year-out performance to meet the highest reliability standards.

Such exclusive developments as the patented POWER-O-MATIC 60® Saturable Reactor Proportioning Control and the patented POWER-O-MATIC 70®, POWER-O-MATIC 80® and POWER-O-MATIC 90® Solid-State Proportioning Controls have made Blue M equipment far and away the recognized standard for quality and reliability.

Some of the engineering and manufacturing facilities making this possible are shown on the following pages. Impossible to show are the craftsmanship and quality materials which go into all Blue M equipment. These become apparent only after the product is in use—and provides the kind of performance you expect from truly dependable equipment. Recent innovations, such as the remarkable FRICTION-AIRE™ electric ovens with *no* heating elements, are tangible evidence that modern, progressive thinking continues to guide the company's progress.

We sincerely believe that between the covers of this catalog you will find the broadest, most versatile, finest quality scientific and laboratory equipment in America. Any selection you make from it will measure up to your expectations in every way.

Corporate headquarters and plant, Blue M Electric Company, Blue Island, Illinois. All manufacturing and testing is conducted here. Recent additions have brought the total area under roof to approximately 350,000 square feet.

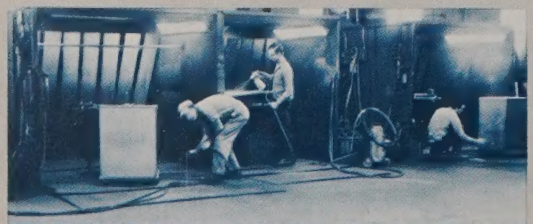


DESIGN/ ENGINEERING

The built-in reliability of all Blue M products begins right at the design stage. Careful engineering assures optimum performance and long-life at competitive cost. Blue M units are also subjected to continued study and review under actual operating conditions. This often suggests modifications and improvements which are incorporated into new designs . . . resulting in a constantly modernized product line. As you read this catalog, you'll find many new products being introduced here for the first time. This constant program of product development continues Blue M's leadership in the fields we serve.

Fully equipped research laboratory where exhaustive analysis—including prototype testing—of new designs is conducted before equipment is released for production.

The latest techniques in spot, arc, gas and heli-arc welding contribute much to the rugged durability of every Blue M product. New painting/baking facility, below, applies attractive long-lasting baked-on finishes in various attractive colors which complement any laboratory or production department. Carefully trained mechanics, right, perform a variety of delicate operations with practiced skill.

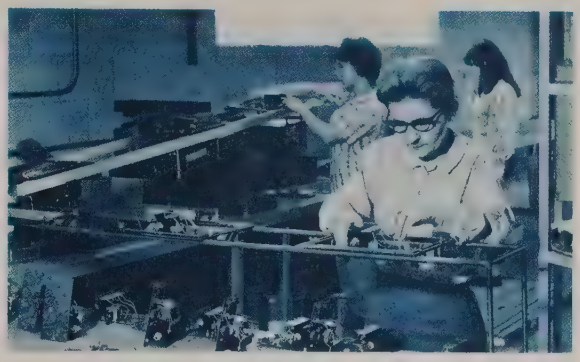


FABRICATING

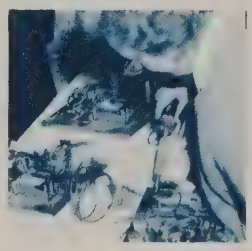
Blue M uses the latest fabricating machinery and methods for various shearing, forming, punching, notching and other operations. Special gauges, fixtures and templates insure repetitive tolerances. All stages of manufacture are closely controlled to assure adherence to the tightest production—and delivery-schedules. Blue M is qualified and thoroughly experienced in the fabrication of cold rolled steel, stainless steel, copper, brass, aluminum, etc. We pride ourselves in being uniquely capable in the fabrication of stainless steels of all types.

CONTROL ASSEMBLY

Control assembly requires special ability, care and attention. The department devoted to this exacting work employs only highly trained personnel working under ideal conditions. Here are assembled, inspected and thoroughly tested the patented POWER-O-MATIC 60® Control and other exclusive Blue M control systems. Special panels, components and compartments facilitate production—make a major contribution to Blue M reliability in the field.



Above, modern wave soldering is utilized in the manufacture of the patented POWER-O-MATIC 70® Solid-State Proportioning Control System. After final assembly, every control is tested individually by the most sophisticated electronic instrumentation to detect any possible imperfections. Here, and left, other views of control assembly. All controls are subjected to rigid testing to insure proper operation in service.



FINAL ASSEMBLY

Although Blue M products are noted for their reliability, modern production planning enables many of them to be manufactured in volume quantities as these photos show. No-waste, production line manufacture speeds assembly —helps Blue M provide a better unit at a competitive price.

Left: A number of temperature/humidity chambers near completion. Below: Water baths on the assembly line.

BLUE M

QUALITY CONTROL

Every step in the manufacture of every Blue M unit is carefully supervised to assure the uncompromised quality of the finished product. This extends to the selection of raw materials as well as to whatever purchased components may be included in any given product. By the time the unit is completed, it has been checked and rechecked to make sure it will withstand Blue M's rigid performance testing. This testing varies with the kind of equipment and is tailored to suit it. Top left, for example, ovens undergo a calibration test using a battery of strip chart recorders; top right, small temperature/humidity chambers undergo individual testing; center, facility for evacuation and charging of all Blue M refrigeration equipment. Capable of handling up to six separate units at once, it assures clean, dry refrigeration systems which can mean years of additional trouble-free service. Below left, Blue M Portable Cooling Units and refrigeration equipment such as is used on Blue M Baths are individually tested in this specially designed facility; near left, special test apparatus is used for checking 50 cycle units. These and other test/inspection procedures make sure every Blue M unit meets the performance standards for which it was designed—including stringent Government Specifications where applicable.

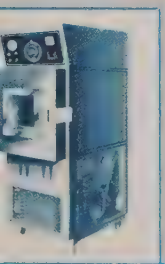
SHIPPING, DOMESTIC OR EXPORT

Every Blue M unit is carefully packaged or crated for shipment. Most units are packed in cartons especially designed for them. This extra care in the last step of unit processing makes doubly sure that Blue M equipment arrives at its destination safely—ready to deliver all the efficiency and reliability designed into it at the factory. Export packing and crating is in accordance with the best recommended procedures.

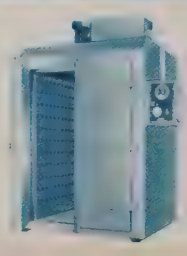
BLUE M EQUIPMENT

A Sales and Service Branch of Blue M Electric Company

A SEPARATE ORGANIZATION DEVOTED TO YOUR CUSTOM EQUIPMENT REQUIREMENTS



Typical Blue M Equipment products: left, Versa-Range® Refrigerated Test Chamber with versatile −100°F. to −400°F. range; bottom left, Dual Thermal Shock Test cabinet designed for exacting testing to military specifications; center, Industrial Batch Oven in sizes to 96 cu. ft. available with a variety of options; right, Full Range Constant Temperature/Humidity Cabinet with Dual Wet and Dry Bulb POWER-O-MATIC 60® Control Systems capable of meeting every current MIL humidity spec.



In recent years, the demand for increasingly more accurate and reliable environmental life-test and process production equipment for the semiconductor field and industry has continued to grow. Special requirements of the electronics industry as well as specialized needs of general industry have made it virtually impossible for any one standard equipment line to meet every contingency.

Blue M Equipment was established some years ago to provide the design, technical sales and service help in developing special equipment to meet these needs. Operating as a separate sales and service branch of Blue M Electric Company Blue M Equipment is staffed by temperature controlled equipment experts fully capable of working with your engineering and technical personnel to produce quality equipment meeting the most stringent demands. This is a true "idea-to-blueprint-to-finished-product" service—backed by the design and manufacturing skill of one of the leaders in the temperature control field.

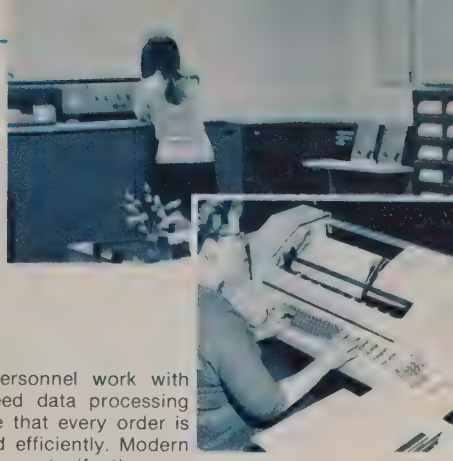
Recently, Blue M instigated a new service whereby Blue M equipment is kept in optimum working order on a contractual basis. This new maintenance program provides further assurance that Blue M units will perform reliably under demanding field operating conditions.

Blue M Equipment offices are strategically located throughout the country as well as centrally at Blue Island, Illinois, to serve all areas of the country directly.

If you have a temperature control problem requiring out-of-the-ordinary skill . . . need help in producing a special unit, one of a kind or a hundred—contact Blue M Equipment. Without obligation, of course.

INVENTORY

Most Blue M units are carried in stock, and are often shipped the same day an order for them is received. Delivery on modified standard equipment is also prompt since Blue M maintains an extensive inventory of accessories. Complete spare parts inventory assures equally speedy replacement. Besides a reputation for reliable equipment, Blue M has long been recognized as providing the fastest delivery in the industry.



Specially trained personnel work with the latest high speed data processing equipment to insure that every order is handled quickly and efficiently. Modern facilities such as these typify the progressive methods in operation throughout the company.

PRODUCT DISPLAY ROOM

This showcase of representative Blue M units enables interested individuals or groups to see how this equipment operates, and to study its many design and construction features in detail. Also, special plant tours for small groups of engineers, and laboratory and production personnel can be arranged at any time. We welcome this additional opportunity to serve you.

SERVICE

All Blue M equipment has been engineered to give long, virtually maintenance free service. Many units have been designed to operate unfailingly for decades! Any equipment, however, regardless of how well constructed may eventually require attention—parts, components, professional maintenance. When required, trained Blue M technicians—from the factory or from local distributor organizations coast to coast—are available to make on-site calls to place your equipment in service quickly, efficiently and economically. Your downtime is slashed to a minimum . . . your testing/processing procedures are never seriously delayed.

Blue M engineers are available at any time for consultation in helping select the exact unit which best suits your requirements . . . and Blue M stands behind that unit with parts and service to keep it operating as specified. It's an unbeatable combination that results in complete satisfaction.

,000 square foot Blue M Equipment sales/service facility at El Monte, alifornia. An extensive inventory facilitates delivery and service in the far est. Below, eastern counterpart to El Monte is this new 16,000 square foot les/service center at Framingham, Massachusetts, which serves the entire w England area directly.

BLUE M

BLUE M *International*

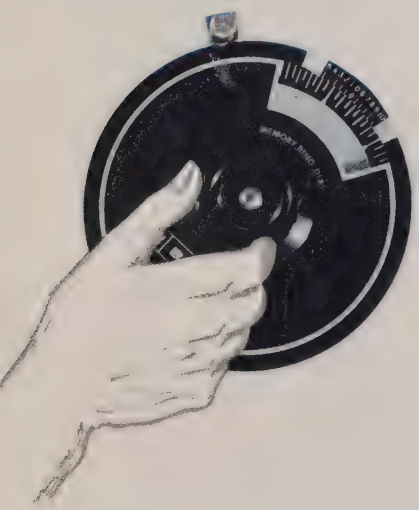
MARKETPLACE FOR BLUE M PRODUCTS THROUGHOUT THE FREE WORLD

This newest Blue M sales organization was formed in 1964 to handle the growing demand for Blue M products in countries outside the United States. Headquartered at Blue Island, Illinois, Blue M International markets equipment through a network of selected representatives located throughout the free world.

BLUE M

BLUE M

THE ONLY COMPANY MAKING TEMPERATURE CONTROLLED EQUIPMENT AND THE CONTROLS TO REGULATE IT



set them... and forget them!

POWER-O-MATIC 60® PATENTED

POWER-O-MATIC 40® PATENTED

POWER-O-MATIC 80® PATENTED

POWER-O-MATIC 90® PATENTED

Used exclusively on Blue M's revolutionary FRICTION-AIRE™ chambers — the ovens with no heating elements. See pages 18-23

That's well worth remembering because of its importance to you as a specifier of constant temperature controlled equipment. If you think about it a minute, you'll see why . . .

It's no secret that many companies make such equipment. We think we make the best, and we think an examination of the construction details of any of the hundreds in this catalog will verify it. But even the best built chamber (or car, or radio, or anything that must operate in order to perform a function) isn't much good if it doesn't offer the performance required to do its job properly. And since the prime purpose of any such chamber is to serve as a reliable means to duplicate a desired environment (heat, cold, moisture, etc.), the key to its performance lies in the method of regulating temperature. The controls, in short.

Blue M believes the best performance is achieved only when the control and chamber are perfectly matched. Like a car. A Buick will operate if you put a Ford engine in it. Or a Dodge engine. But the Buick will probably operate best with a Buick engine. Similarly with chambers. You can't build one, slap just any available instrumentation on it, and expect peak performance.

There are exceptions, of course, where practicality enters the picture. In budget-type gravity ovens, for example, requirements aren't critical and good performance is adequate. It's senseless to use hundreds of dollars of instrumentation with an $80.00 shell. Not only would such equipment be priced beyond the market, but it might well offer far better performance than ever needed. It might provide ±0.1°C. control when ±5.0°C. would do the job. This would be analogous to delivering milk from a Rolls-Royce.

Accordingly, Blue M offers the scientific and laboratory field equipment both quality-built and matched exactly to the needs of the marketplace. We build equipment priced down with the lowest for run-of-the-mill needs and products that meet or exceed even the most stringent performance demands. They meet these requirements and remain competitively priced because they feature Blue M's own control systems which complement the cabinets exactly.

These systems are described on the following pages. Units equipped with each system together with the pages where they can be found are also listed. Please review this material carefully. It may well suggest why Blue M is the leading manufacturer of fine temperature controlled equipment. And why it is the only such equipment you should buy.

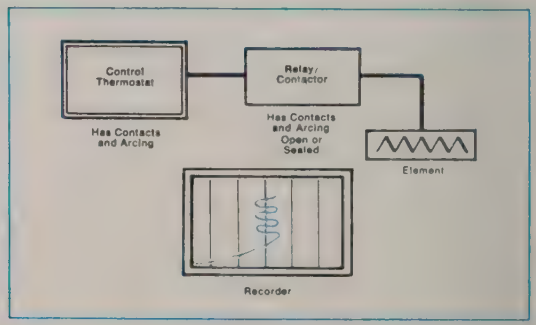
THE BEGINNING . . .

When Blue M began building equipment in 1946, the only controls available were the conventional, commercially produced on-off type. All manufacturers used them, and Blue M was no exception.

The two such systems illustrated here employ the so called "cycling method": they turn a resistive load "on and off." The entire system shown in Figure 1 consists of a thermostat, relay and heating element. While simple enough in design, it results in a definite temperature fluctuation within the chamber as measured by sensitive recording instrumentation and illustrated by the recorder drawing.

Figure 2 illustrates an improved control system. It utilizes switching devices to reduce the element watt-

FIGURE 1. CYCLING METHOD: FULL RESISTIVE LOAD TURNED ON AND OFF. WIDE TEMPERATURE FLUCTUATIONS.



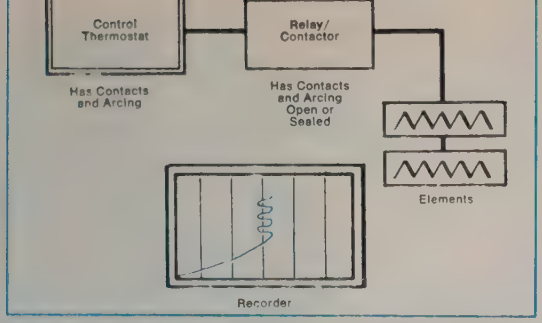


FIGURE 2. CYCLING METHOD: SLIGHTLY IMPROVED PERFORMANCE AND RELIABILITY DUE TO REDUCED WATTAGE AND SWITCHING ELECTRICAL INPUT RATE. TEMPERATURE FLUCTUATION STILL WIDE.

age (subdivided) and to aid in minimizing temperature fluctuations. This system represents a definite improvement, yet it fails to provide the performance needed to meet critical applications. Such systems are still in widespread use today.

Although forced to use such devices initially, Blue M was meanwhile at work developing a new system which would greatly better performance. Figure 3 shows the result of this effort—the original Blue M POWER-O-MATIC—the first truly improved control ever developed. It utilized a multiple switch control, relays and multiple groups of heating elements. Being automatic in operation and having a multiple series of elements which could be proportioned in relation to temperature, POWER-O-MATIC produced excellent results. However, it was still a cycling method and—as in conventional systems—used contacts and timing devices with, of necessity, some complexity in design to achieve this overall improvement. It was obvious to Blue M that a fully proportional control system was required—especially for high-powered chambers—to meet the demand for extremely close temperature control which was arising at this time.

Figure 4 illustrates Blue M's solution to this problem—the POWER-O-MATIC 60 Saturable Reactor Proportioning Control System. With the development of this patented system in 1960, Blue M achieved what had never been done before: produced a simple, reliable control offering true straight-line, infinitely proportional performance. Because it was (and is) one of the most significant of all control developments, it is worthy of the close attention paid to it on the following pages.

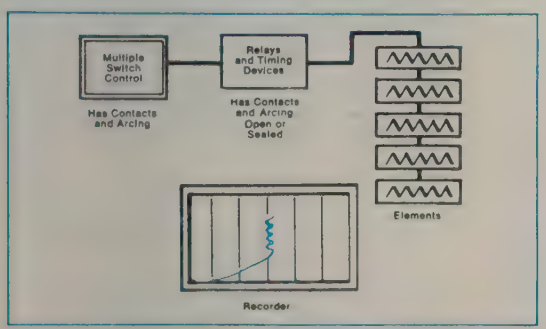
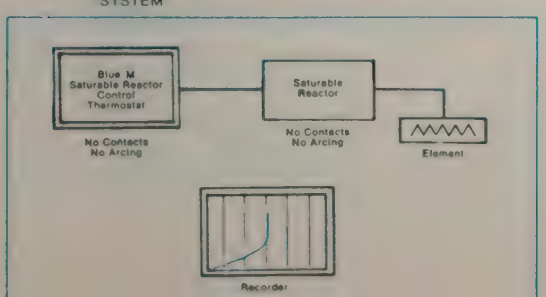


FIGURE 3: ORIGINAL BLUE M POWER-O-MATIC THE FIRST APPROACH TO A SYSTEM WITH AUTOMATIC WATTAGE CONTROL

FIGURE 4: BLUE M POWER-O-MATIC 60® SATURABLE REACTOR PROPORTIONING CONTROL SYSTEM



BLUE M

POWER-O-MATIC 60®
PATENTED

saturable reactor proportioning control system

THE ULTIMATE IN RELIABILITY AND ACCURACY TO MEET THE MOST CRITICAL PERFORMANCE REQUIREMENTS

Stepless, switchless, infinitely proportional, POWER-O-MATIC 60 is a dramatically different proportioned reactor control system which keeps temperature constant, straight-line, and repetitive throughout the entire unit range. It is simple . . . automatic . . . has no moving parts . . . no electrical contacts to burn, wear or replace. You just set a simple calibrated dial—and you get the exact temperature called for every time!

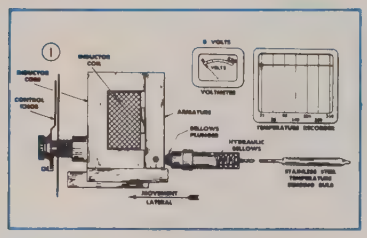
POWER-O-MATIC 60 has proven itself in exacting applications of all descriptions. It is virtually fool-proof . . . literally outlasts the equipment it controls!

Equally important, POWER-O-MATIC 60 is economical. It is far less expensive than systems combining saturable reactors, electronic instruments and magnetic amplifiers—complex equipment which often costs as much—or more—than the equipment it controls. Combining for the first time a saturable reactor, a hypersil core, and a thermostatic bellows, POWER-O-MATIC 60 is competitively priced with standard equipment using conventional hydraulic or electronic thermostats with relays, switches and other failure-prone components.

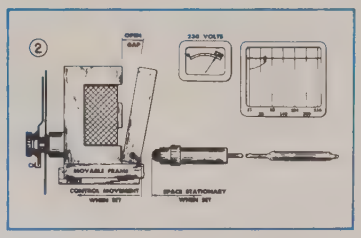
The immediate success of the POWER-O-MATIC 60 Control System proved conclusively the value (and need) of one company being able to furnish equipment and controls. Today, there are thousands of these systems in active service. To the best of our knowledge, every POWER-O-MATIC 60 Control System ever built is still operating . . . is still maintaining the close control tolerances for which it was designed.

While POWER-O-MATIC 60 itself is still basically the same as it was when it was developed over a decade ago, the chambers of which it is a part have been significantly improved. They offer many new features which complement the control's inherent safety and reliability, and enable you to benefit from operational ease and dependability without equal. Some of these exclusive advances are described on pages 14 and 15

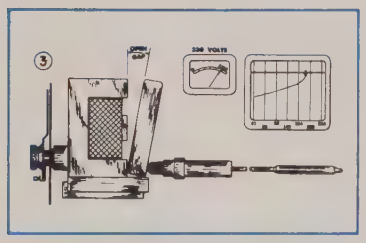
HOW POWER-O-MATIC 60® PATENTED OPERATES



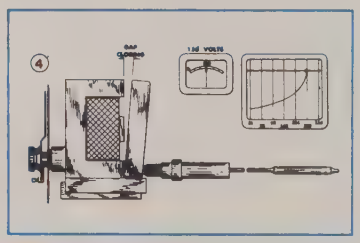
STEP No. 1: Control setting at ambient temperature. Armature gap is normally closed with bellows plunger non-extended.



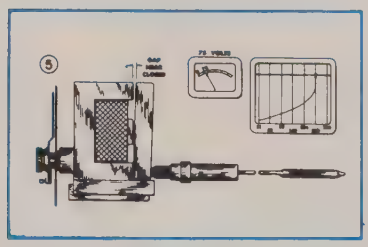
STEP No. 2: Control setting at +260°C. Note lateral movement of inductor coil and inductor core with resultant stationary space between bellows plunger and armature. Voltmeter reading at full voltage and remains thus until plunger is extended.



STEP No. 3: Hydraulic bellows expansion due to temperature rise causes bellows plunger to extend laterally to contact armature. FULL ELEMENT HEAT UTILIZED TO THIS POINT. Control action now within proportional band of 4% of scale range. In this illustrative case of +260°C. setting, temperature is +249°C. and voltage (wattage) will now begin to decrease. See next illustration.

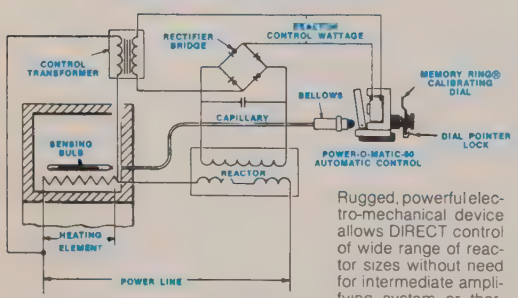


STEP No. 4: Control action operating within proportional band. Powerful bellows plunger rapidly closes armature gap and temperature begins to stabilize. Extremely sensitive action provides proportional regulation of wattage and temperature. Note voltage decrease to 150 volts.



STEP No. 5: —OVEN AT EQUILIBRIUM: Control operation stabilized at +260°C. and performance is TRUE STRAIGHT-LINE. Bellows plunger movement due to temperature increase or decrease (because of heat load changes) causes voltage (wattage) to automatically increase or decrease, correspondingly. Control stabilization is in a true static state, stepless and fully automatic.

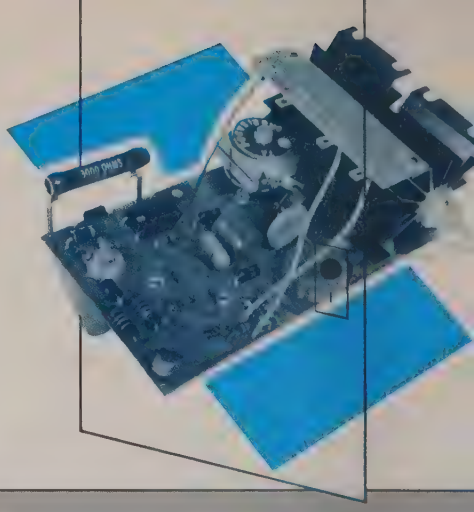
BLOCK FORM ELECTRIC DIAGRAM



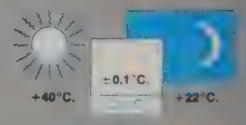
Automatic compensation for line voltage fluctuations and ambient temperature changes is built in.

Rugged, powerful electro-mechanical device allows DIRECT control of wide range of reactor sizes without need for intermediate amplifying system or thermocouples.

Diagram illustrates circuit construction employed to produce full-range proportional temperature control. Variable impedance driven by temperature-sensitive mechanical drive; control winding circuit in series with voltage source. Provides means to convert small mechanical motion into wide range of voltage changes and corresponding wide range of pre-set constant temperatures.



UNIQUE POWER-O-MATIC PATENTED ADVANTAGES



BUILT-IN AMBIENT TEMPERATURE COMPENSATION

Lets you ignore ambient temperature changes that can occur where your chamber is operating. Maximum temperature shift due to ambient temperature change of ±5°C. is ±0.1°C. through 22°C. (+72°F.) to +40°C. (+104°F.) range.

BUILT-IN INSENSITIVITY TO FREQUENCY

The POWER-O-MATIC 70 Control System has been engineered to operate from either 50 or 60 Hz. power lines. This means that many units can be used in the U.S. and overseas.

LATEST ADDITION TO BLUE M'S OWN PROPORTIONING CONTROL SYSTEMS FOR CRITICAL STRAIGHT-LINE PERFORMANCE AT ELEVATED TEMPERATURES

BLUE M

POWER-O-MATIC 70®

PATENTED

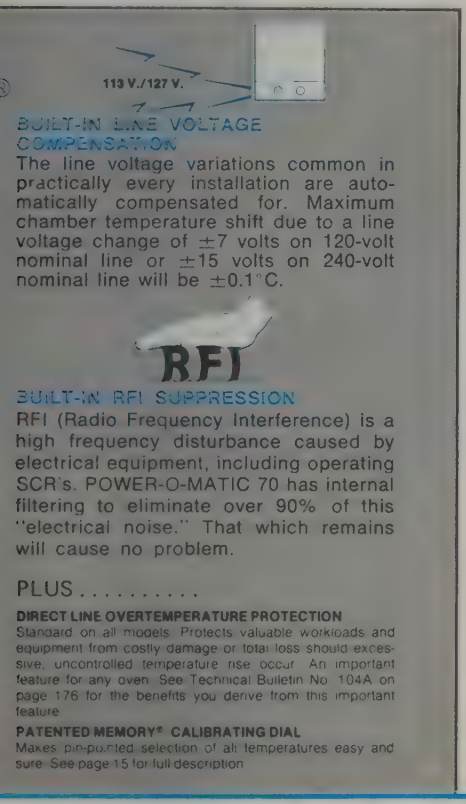
solid-state proportioning control system

BRINGS TRUE STRAIGHT-LINE PERFORMANCE WITHIN REACH OF THE MOST MODEST BUDGET

Drawing upon the experience and knowledge acquired through the POWER-O-MATIC 60 and aided by the advances in electronic technology in the early 1960's, Blue M developed the POWER-O-MATIC 70 Control in 1967. This patented solid-state device also provides truly proportional, straight-line temperature performance, yet is directly competitive with outmoded, failure-prone on-off controls. As such it is ideally suited for traditionally modest laboratory equipment budgets.

POWER-O-MATIC 70 consists of a temperature sensitive resistance network exercising phase control on two SCR's. Voltage is controlled by a Zener Diode. It has adjustable operating ranges from 0°C. to +300°C. Ranges are selected to match specific types of cabinets. It provides a control tolerance of ± 0.2°C. in mechanically convected models with super fast response to temperature changes measured in milli-seconds by the temperature sensor.

POWER-O-MATIC 70 and the new POWER-O-MATIC 80 described below allow Blue M to offer solid-state proportional performance for temperatures from 0°C. to +1620°C.



BUILT-IN LINE VOLTAGE COMPENSATION

The line voltage variations common in practically every installation are automatically compensated for. Maximum chamber temperature shift due to a line voltage change of ±7 volts on 120-volt nominal line or ±15 volts on 240-volt nominal line will be ±0.1°C.

RFI

BUILT-IN RFI SUPPRESSION

RFI (Radio Frequency Interference) is a high frequency disturbance caused by electrical equipment, including operating SCR's. POWER-O-MATIC 70 has internal filtering to eliminate over 90% of this "electrical noise." That which remains will cause no problem.

PLUS . . . . . .

DIRECT LINE OVERTEMPERATURE PROTECTION

Standard on all models. Protects valuable workloads and equipment from costly damage or total loss should excessive, uncontrolled temperature rise occur. An important feature for any oven. See Technical Bulletin No. 104A on page 176 for the benefits you derive from this important feature.

PATENTED MEMORY® CALIBRATING DIAL

Makes pin-pointed selection of all temperatures easy and sure. See page 15 for full description.

CAPABILITIES OF OVENS WITH POWER-O-MATIC 70®

PATENTED

Proportional controls provide heat in direct relation to the heat required to maintain a particular temperature. One important system parameter is its proportional band width—defined as the temperature change necessary to cause electric power to the heaters to change from 100% to about 10% of its rated value, or vice versa. Although band width varies from one end of the setting range to the other, it averages about 2°C. on POWER-O-MATIC 70. Other control and oven capabilities:

TEST CONDITIONS & RESULTS OBTAINED AT BLUE M

Line Voltage and Ambient Conditions Set Up at Blue M	Typical Results After Stabilization in Mechanical and Gravity Ovens with Parameters Described in Column 1	Mech. Ovens	Gravity Ovens
CONSTANT Line Volts CONSTANT Amb. Temp.	Max. Deviations of Control Temp. to Set Temp.	±0.2°C.	*±0.5°C.
Voltage CHANGE (± 7 V. on 120 V., nom.) (±15 V. on 240 V., nom.)	**Max. Temp. Shifts due to Line Voltage Change	±0.1°C.	±0.2°C.
Ambient CHANGE (Conditions varied ±5°C.)	***Max. Temp. Shifts due to Amb. Temp. Change	±0.1°C.	±0.2°C.
Total temperature difference with voltage and ambient conditions listed above		±0.4°C.	±0.9°C.

*This reading obtained by use of sheathed thermocouple.
**POWER-O-MATIC 70 will operate from any power line within ±20% of the unit's rating.
***POWER-O-MATIC 70 operates through an ambient range of —20°C. to +60°C.

BLUE M

POWER-O-MATIC 80®

PATENTED

The development, pertection and—now—introduction of the POWER-O-MATIC 80 Control marks the successful culmination of a research effort begun some years ago. Its purpose: to provide the industrial community in general and the scientific and laboratory community in particular with a line of Superior Blue M controls—all fully proportional in operation—to match the broad temperature spectrum covered by our equipment.

The POWER-O-MATIC 80 can, essentially, be considered to be an extension of the popular and widely accepted POWER-O-MATIC 70 Control. The POWER-O-MATIC 70 provides reliable straight-line performance at temperatures to +300°C.; the POWER-O-MATIC 80 assures fully proportional performance at temperatures to as high as +1620°C. (+2950°F.)—the upper limit for equipment in this catalog.

Like its lower-range companion, the POWER-O-MATIC 80 Control is a modern, solid-state device, efficient and compact. It includes a high gain solid-state amplifier and SCR's to modulate power to the heating elements, and incorporates the latest in solid-state technology—integrated circuitry. Plug-in modular design enhances reliability and simplifies routine inspection procedures. Rapid, accurate temperature sensing by means of a thermocouple matched to the specifications of the individual cabinet assures unusually fine response. A 10-turn potentiometer with Vernier dial, working in conjunction with Blue M's patented Memory Ring® Temperature Calibrating Dial, assure unmatched, pin-pointed setability and repeatability.

POWER-O-MATIC 80 for the first time brings true straight-line, infinitely proportional performance—and all its advantages—to those performing critical work at high temperatures. It enables the discriminating buyer to have the superior performance he needs—regardless of operating requirements. As such, we honestly feel it is one of the most important contributions to control design ever made.

TYPICAL BLUE M CONTROL PANEL

The clean, simple, efficient design of this Blue M POWER-O-MATIC 60 Oven control panel all but eliminates the possibility of operator error. (They are even mounted on pull-out drawers in some models.) This same foolproof clarity is inherent on every Blue M product—be it an Oven, Bath, Furnace or Temperature/Humidity Cabinet. Although panels will vary somewhat from unit to unit, we have identified and described all the components from this typical unit because many of them are common to most chambers in this catalog, most of them are exclusive with Blue M, and all help assure your complete operational satisfaction.

NEON PILOT LAMP
Red; shows unit is in operation.

VOLTMETER
Indicates voltage on heating element.

PROTECTIVE FUSE
Added safety against electrical malfunction.

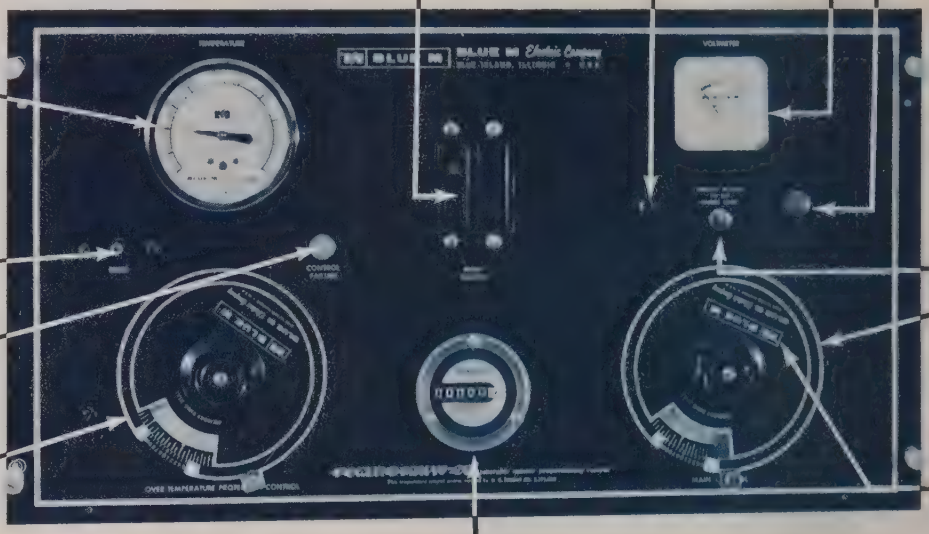
MAIN SWITCH
Turns oven on and off.

READY-READ TEMPERATURE INDICATOR
Easy to read 3½" diameter dial, graduated in both Centigrade and Fahrenheit, with range matched to unit. Stainless sensing bulb.

MAX-SET OTP MANUAL RESET SWITCH
As described below, this switch must be used to reactivate MAX-SET Overtemperature Protection if failure ever occurs.

MAX-SET OTP INDICATOR LIGHT
As described below, this amber light signals only when the unit is in a true failed condition.

NEW TIME DELAY
Max-Set(TM)
OVERTEMPERATURE PROTECTION



PROBABLY THE MOST SOPHISTICATED BUILT-IN SAFEGUARD EVER DEVELOPED!

Exclusive Blue M design—providing positive protection of valuable workloads and equipment—offers features, operational efficiency, and simplicity never before available.

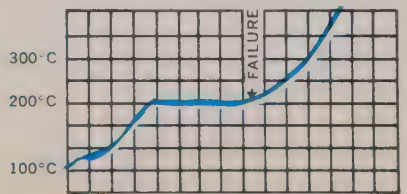
MAX-SET eliminates nuisance tripping. If OTP should be activated due to a significant line voltage surge or sudden shock, for example, an alarm sounds to alert the operator. This alarm stops once conditions return to normal, the OTP resets automatically, and the chamber continues to operate.

However, should a true overtemperature condition arise—due to component failure, combustion within the chamber, etc.—the alarm will sound as MAX-SET shuts down the chamber. As conditions within the chamber reach a temperature below OTP set point, the alarm stops and the chamber is once again activated. If the problem has not been solved, temperature will rise and trip the OTP. Again the alarm will sound and MAX-SET will shut down the unit. This cycle repeats several times until MAX-SET automatically shuts down the chamber and silences the alarm permanently. An amber light (see above) then signals the operator that the chamber is in a true failed condition and that remedial steps must be taken. After the cause of the failure has been determined and corrected, MAX-SET must be reactivated by means of a manual switch (see above).

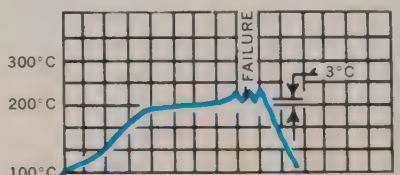
MAX-SET features full scale setability—can be set to operate at any temperature within the chamber's range. And OTP set point is easily established and quickly located—permitting overtemperature setting to be established very close to desired operating temperature and minimizing the chance of operator error.

MAX-SET, as described here and with variations in conjunction with other instrumentation, is standard on many units in this catalog. It is also available separately for use on existing equipment as shown on page 164.

WITHOUT MAX-SET OTP
Failure of control or other components results in temperature increase and resultant loss in workload and equipment.



WITH MAX-SET
Primary + Secondary
Complete protection for equipment and workload. Power off, alarm sounds. After several cycles, unit shuts down permanently, alarm shuts off, light on.



ELAPSED TIME METER
SERVES A VARIETY OF USEFUL FUNCTIONS TO SAVE YOU MONEY

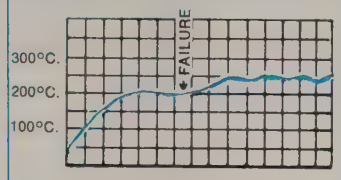
The Elapsed Time Meter now standard on many units in this catalog provides information which can greatly improve operational efficiency while saving money. Its function, of course, is to show exactly how long the unit has actually operated. It is rated at 99,999.9 hours. Properly used, these data can serve a number of uses.

For example, the Elapsed Time Meter can show how long a given test or process has run. For prolonged life-test work, particularly, the Meter can serve as a timer since it is accurate to 1/10 of an hour.

Many companies have regular maintenance programs based on the calendar rather than on equipment usage. Intermittently used equipment may be on a 30-day schedule with maintenance dutifully carried out, even though the equipment may not have been used at all during that particular period. By showing just how much time the equipment has been used, the Meter can avoid unnecessary maintenance and expense. Verification of actual operating time

RANGE-LOCK
AN ADDED SAFETY FEATURE AT NO ADDED COST

It should be noted that units equipped with POWER-O-MATIC 60 Control also feature Range-Lock Overtemperature Protection. This device mechanically locks the control armature and prevents an excessive rise of the set temperature (limits power input) even if thermal system ruptures or if control knob is accidentally turned. Range-Lock's operation is illustrated in the chart at right. As indicated, it prevents temperature runaway but does allow a temperature rise of some significance. Built-in MAX-SET OTP system described on the preceding page limits temperature rise much more severely—on the order of 3°C.



WITH RANGE-LOCK
Primary safety protection built-in. Locking of control armature (limits power input) and prevents excessive temperature rise. This is in addition to the more restrictive operation of MAX-SET described earlier.

EXCLUSIVE **BLUE M** CONTROL

BACKED BY THIS UNIQUE GUARANTEE — YOUR FINAL ASSURANCE OF RELIABILITY

Every unit in this catalog with Blue M Controls is backed by this guarantee. Not only is it absolutely unique, but it verifies our confidence in these superior controls and everything we say about them. It proves, too, that not only does Blue M make controls . . . we make the best controls for our equipment. Coupled with the many standard design and engineering features on these chambers, Blue M control systems make the Blue M unit of your choice the wisest choice you can make.

UNIQUE WARRANTY

All equipment in this catalog is covered by Blue M's exclusive Warranty. This includes the individual units themselves as well as—in the case of Blue M Control Systems particularly—the control instrumentation. Details of this Warranty are provided on page 16. We urge you to review this material carefully. It is your final assurance of complete satisfaction with the Blue M chamber of your choice.

can also be used to compute monthly or yearly equipment costs.

The purchase of capital equipment is often predicated, in part, on the amount of time it will be utilized by a given facility or department. The Meter "reports" and verifies precisely how much time the equipment is really used—and serves to indicate whether there is a need for like equipment in the future, how much such equipment is needed, and even when it should be purchased.

Finally, it is common practice for most manufacturers to make extraordinary performance promises when new equipment is being evaluated before purchase. These promises are often conveniently forgotten once the equipment is installed and problems develop. The Meter not only proves our performance commitments, but its very presence on the Blue M unit you buy verifies our faith in our equipment. It wouldn't be there if we had something to hide. The Elapsed Time Meter is one more assurance of your complete satisfaction with the Blue M equipment you select.

EXCLUSIVE DUAL SCALE

MEMORY RING™

TEMPERATURE CALIBRATING DIAL

STANDARD ON ALL BLUE M CONTROL SYSTEMS

MAKES PIN-POINT CALIBRATION OF ALL TEMPERATURES EASY!

All Blue M Control Systems feature this advanced development . . . makes them all easier to use and more accurate than ever. Blue M equipment is calibrated to commercially acceptable standards before shipment. The Memory Dial lets you zero-in on all temperatures, or those you use most, with laboratory exactness —and "remembers" every calibration factor for reproducibility. Simply write proper correction factor for any given temperature on the dial. Next time that temperature is required, correction factor automatically appears in the dial window. You get the exact temperature called for every time. Dual scale in both °C. and °F. Dial Pointer Lock secures your temperature setting . . . prevents inadvertent change by accidental bumping or unauthorized personnel. Memory Ring is also an integral part of MAX-SET OTP and other Blue M overtemperature protection systems.

CHAMBERS IN THIS CATALOG EQUIPPED WITH

POWER-O-MATIC 60®
PATENTED

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PATENTED

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POWER-O-MATIC 60®
Patented

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GENERAL BLUE M PARTS WARRANTY AND REPLACEMENT SERVICE PROGRAM

All Blue M equipment is warranted against defective material and workmanship. This warranty varies with the type of equipment sold, but in no instance is it less than one year from date of shipment. All replacement parts will be invoiced and credit issued upon receipt of defective part.

1. Control Systems Manufactured By Blue M: Defective parts will be replaced without charge, for installation by user, including normal transportation charges within continental United States and Canada, as follows:

Fully Proportional

POWER-O-MATIC 60:	5 Years
POWER-O-MATIC 70:	2 Years
POWER-O-MATIC 80:	2 Years
POWER-O-MATIC 90:	5 Years

On/Off Cycling

MICROTROL	1 Year
DUAL MICROTROL	1 Year

2. Heating Elements. Are warranted from one year up to five years depending on equipment. However, furnace elements and thermocouples, although designed specially for furnace service and built of the finest materials, cannot be guaranteed because it is impossible to predict the temperature or severity of service to which they will be subjected. (See product listing.)

3. Commercial Instrumentation Manufactured By Others: Covered by separate manufacturer warranty, generally one year. Contact Blue M for instructions on obtaining service.

4. Blower Motors and Refrigeration Compressors: Covered by separate manufacturer warranty, generally one year. Contact Blue M for instructions on obtaining service.

5. All Other Components: Including switches, pilot lights, relays, transformers, Ready-Read Temperature Indicators, hardware and gaskets will be replaced without charge for installation by user up to one year from date of shipment.

Our warranty does not cover damage or failure caused by abuse, misuse, abnormal usage, faulty installation, improper maintenance or any repairs other than those provided by authorized Blue M Service Personnel.

The foregoing warranties are in lieu of all other warranties expressed or implied, including the guarantees of merchantibility or fitness and there are no obligations or liabilities on the part of Blue M Electric Company for consequential damages arising out of or in conjunction with the use or performance of the product or other indirect damages with respect to loss of use revenues or profit.

There are no warranties which extend beyond the description on the face hereof. The foregoing states our entire liability in respect to our equipment, except such as authorized executive of Blue M Electric Company may otherwise agree in writing.

The above is a general statement of warranty. Some Blue M Products are covered under individual service and replacement policies. Details on request.

Blue M Maintenance Agreement Program. Blue M has available a flexible Maintenance Agreement Program which covers the periodic inspection and maintenance of our equipment at the user's location.

This economical program is available from a number of Blue M offices located strategically throughout the United States. Please contact the factory for complete information.

TEMPERATURE CONTROLLED CABINETS

POWER-O-MATIC 60 OVENS

Control System	5 year
Blower Motor (if used)	1 year
Heating Element	5 year
Other Components	1 year

POWER-O-MATIC 70 OVENS/INCUBATORS/STERILIZERS

Control System	2 year
Blower Motor (if used)	1 year
Heating Element	2 year
Other Components	1 year

POWER-O-MATIC 80 OVENS

Control System	2 year
Blower Motor (if used)	1 year
Heating Element	2 year
Other Components	1 year

POWER-O-MATIC 90 OVENS

Control System	5 year
Blower Motor	1 year
Other Components	1 year

OVENS/MECHANICAL CONVECTION

Control System (commercial instr.)	1 year
Blower Motor	1 year
Heating Element	2 year
Other Components	1 year

OVENS/INCUBATORS/GRAVITY CONVECTION

Control System (commercial instr)	1 year
Heating Element	2 year
Other Components	1 year

BATHS

POWER-O-MATIC 70 MAGNI-WHIRL BATHS

Control System	2 year
Heating Element	1 year
Other Components	1 year

MAGNI-WHIRL WATER BATHS

Control System	1 year
Heating Element	1 year
Other Components	1 year

MAGNI-WHIRL OIL BATHS

Control System	1 year
Heating Element	1 year
Other Components	1 year

TISSUE BATHS

Control System	1 year
Heating Element	1 year
Other Components	1 year

PORTABLE COOLING UNITS

Control System	1 year
Refrigeration System	1 year

ENVIRONMENTAL

POWER-O-MATIC 60 ENVIRONMENTAL UNITS

Control System	*5 year
Heating Element	1 year
Other Components	1 year

POWER-O-MATIC 70 ENVIRONMENTAL UNITS

Control System	2 year
Heating Element	1 year
Other Components	1 year

VAPOR-TEMP ENVIRONMENTAL UNITS

Control System	1 year
Heating Element	1 year

FURNACES

POWER-O-MATIC 80 FURNACES

Control System	2 year
Heating Element	Not Warranted
Other Components	1 year

STABIL-GLOW/LAB-HEAT/RAD-O-GLOW FURNACES

Control System	1 year
Heating Elements	Not Warranted
Other Components	1 year

Please refer to specific unit warranties for individual and itemized component warranty.

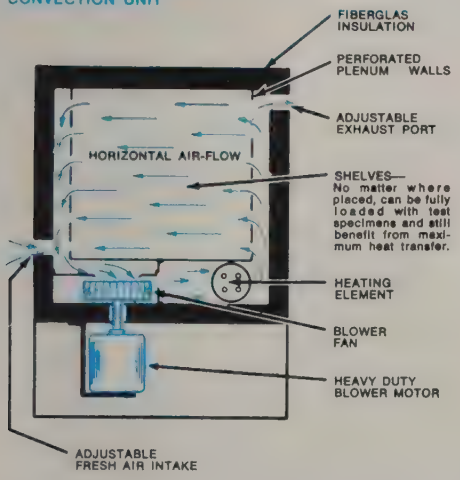
*Due to corrosion and contaminate problems beyond our control, sensing elements of the POWER-O-MATIC 60 Control System employed in Environmental equipment are warranted for two years. All other system parts are warranted five years.

BLUE M OVENS, INCUBATORS AND STERILIZERS

MECHANICAL CONVECTION

FOR ALL CRITICAL SCIENTIFIC LABORATORY AND PRODUCTION WORK WITH AGING, CURING, DRYING, BAKING, PREHEATING, CONDITIONING, LIFE TESTS, ETC.

TYPICAL FRONT SECTIONAL VIEW OF A BLUE M MECHANICAL CONVECTION UNIT


FIBERGLAS INSULATION
PERFORATED PLENUM WALLS
ADJUSTABLE EXHAUST PORT
HORIZONTAL AIR-FLOW
SHELVES—No matter where placed, can be fully loaded with test specimens and still benefit from maximum heat transfer.
HEATING ELEMENT
BLOWER FAN
HEAVY DUTY BLOWER MOTOR
ADJUSTABLE FRESH AIR INTAKE

With a blower system, false walls, plenum chambers and air direction baffles, mechanical convected units are considerably more complex than gravity units. Thus they represent a greater initial expenditure.

These units perform applications from very simple to very complex operations. A mechanical convection unit is simply a superior tool, designed to do more things and do them better than a gravity unit.

A careful analysis of their advantages will indicate if the higher cost is justified for you.

INCREASED EFFICIENCY

Faster heating of workload. More rapid circulation of air transfers heat from element to workload faster.

Closer temperature uniformity at all points within the unit due to high volume, directed air-flow and absence of radiant heat. Provides a greater percentage of useful volume for heavier loading density without impeding airflow or special care in loading of shelves.

Finer control tolerances with less temperature drift. Rapid heat transfer from elements to control sensing bulb provides fast response and long term stability.

Elimination of a variable and better repeatable results.

SAFETY

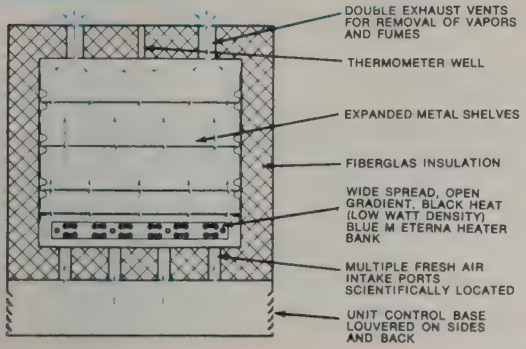
Remote mounted heating elements reduce fire and explosion hazards due to flammable solids or liquids depositing on element wires. (See pages 18-23 for patented FRICTION-AIRE™, the unique oven with no heating elements.)

Adequate ventilation. When applications involve solvent vapors, the most important, single safety precaution is to provide a high rate of exhaust and fresh air intake to prevent vapor concentration from reaching a hazardous level.

GRAVITY CONVECTION

FOR ANALYTICAL LABORATORY, MEDICAL, AND GENERAL CHEMICAL WORK INVOLVING BAKING, DRYING, CONDITIONING, PREHEATING, STERILIZING, INCUBATION, AND SIMILAR PROCEDURES.

TYPICAL FRONT SECTION VIEW OF A BLUE M GRAVITY CONVECTION UNIT


DOUBLE EXHAUST VENTS FOR REMOVAL OF VAPORS AND FUMES
THERMOMETER WELL
EXPANDED METAL SHELVES
FIBERGLAS INSULATION
WIDE SPREAD, OPEN GRADIENT, BLACK HEAT (LOW WATT DENSITY) BLUE M ETERNA HEATER BANK
MULTIPLE FRESH AIR INTAKE PORTS SCIENTIFICALLY LOCATED
UNIT CONTROL BASE LOUVERED ON SIDES AND BACK

Gravity Convection Units are not generally used where extremely critical uniformity, close temperature tolerances, and rapid temperature rise and stabilization are required. However, they offer several advantages not found in Mechanical Convection Units:

A. A lower initial investment cost.

B. For a given temperature range and rating the overall dimensions are smaller due to the absence of baffles, motors, blowers, etc.

C. Less subject to break-downs and lower maintenance costs because there are fewer moving parts.

When uncertain as to which choice should be made, the following rule of thumb will apply in most cases:

The mechanical convection unit will perform all of the simple functions of a gravity unit; a gravity unit cannot duplicate the performance of the mechanical unit for critical applications.

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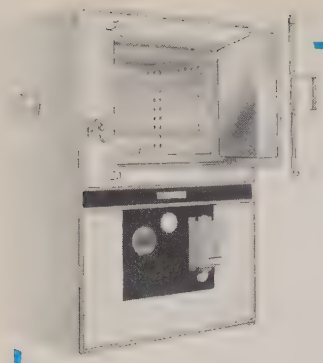
Drying and Dry Air Sterilizers (+204°C.) 68-69
Many models meet ASTM specifications. For a list of these specs, see pages 182-183



A MAJOR BREAKTHROUGH IN THE ART OF

BLUE M FRICTION-AIRE™

PATENTED

with

POWER-O-MATIC 90® PATENTED

non-electric proportioning control system
and non-electric overtemperature protection

THE ELECTRIC OVENS WITH NO HEATING ELEMENTS

NOW . . . 2 SEPARATE AND DISTINCT SERIES

1. The only electric ovens U.L. Listed for Class 1, Group D service. 3 models to +150°C. (+302° F.). See Pages 20 and 21.

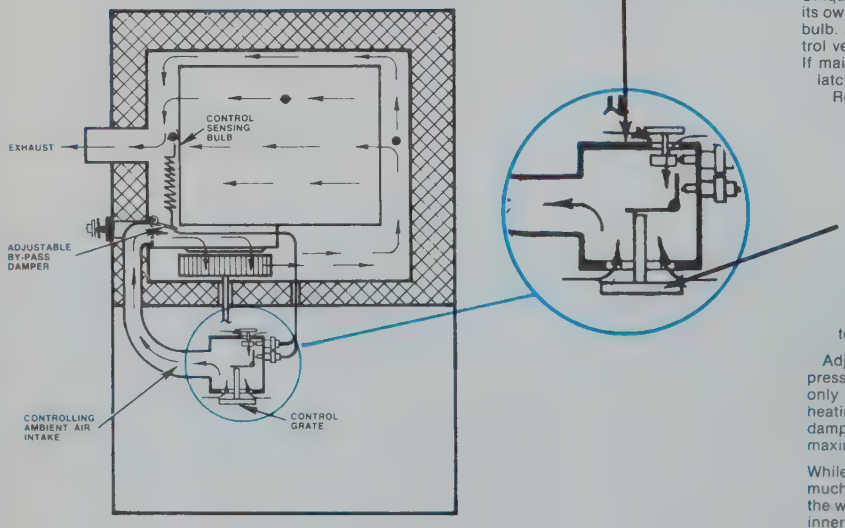
2. Newest series of 3 models with outstanding performance. To +204°C. (+400°F.). See pages 22 and 23.

When Blue M introduced the revolutionary FRICTION-AIRE Oven, it was immediately acclaimed as "one of the 100 most significant technical products of the year" by the prestigious Industrial Research magazine. In a special Business Week magazine feature article on the unit, FRICTION-AIRE was called: ". . . the only real innovation in such ovens since they were first made 50 years ago."

Described here are FRICTION-AIRE's operation, and some chief advantages in detail. As you review them, you'll immediately see that this remarkable development has virtually unlimited application in industries of all kinds: chemical, petroleum, arsenals, electronics, paints . . . for hazardous work, for exacting testing/processing, for general utility work, for drying, aging, life-testing.

At present, there are several Blue M Ovens utilizing this unique concept—including those on the following pages. More are planned. If these data suggest how FRICTION-AIRE might help you, write us outlining your general specifications and requirements. Very probably we can show you how "the only real innovation" in electric ovens in two generations can be put to work for you.

HERE'S HOW IT WORKS



BUILT-IN OVERTEMPERATURE PROTECTION

Unique intrinsically safe non-electrical system powered by its own secondary bellows and responding to its own sensing bulb. A spring-loaded vent with inlet area greater than control vent area is latch-closed by reset lever on control panel. If main control fails, OTP safety sensing bellows trips vent latching mechanism to lock vent in fully open position. Resulting increase in exhaust capacity immediately drops chamber temperature. Vent must be re-closed by manually pressing reset lever. Oven continues operation at safe temperature.

CONTROL OPERATION

Control is a temperature-sensitive bellows regulating a fresh air inlet to blower wheel. Desired temperature is set by control dial. Control grate is closed. As temperature rises with blower operation, bellows expand to open and position grate. More air enters the system, causing sharp temperature curve-off and stabilization.

Adjustable by-pass damper vane establishes control inlet pressure. When horizontal, damper restricts path of blower only through control. Since this reduces CFM and velocity, heating is minimized for control at lower temperatures. When damper is vertical, system recirculates at maximum for maximum heat

While a large air volume must be moved to generate heat, much of it passes through a by-pass chamber surrounding the work chamber. The small percentage passing through the inner chamber is practical for most applications.

BLUE M

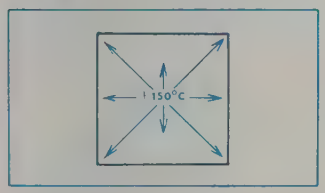
GENERATING AND CONTROLLING ENVIRONMENTAL HEAT

HERE'S WHAT IT DOES

FRICTION-AIRE gives you a controlled environment with 100% straight-line proportional temperature performance WITHOUT HEATING ELEMENTS . . . WITHOUT ELECTRICAL CONTROLS.

Its principle of operation is simple; Blue M has harnessed the law of the Conservation of Energy as set forth by Dr. James P. Joule. In essence, this states that the energy required to set air in motion must appear as heat. By utilizing a high velocity air flow system to move a large volume of air through a prescribed pattern, Blue M has developed a unique environmental chamber with a number of remarkable advantages:

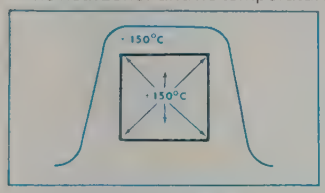
1. There is no central heat source in the system. The blower simply sets the air in motion. It is not operating at temperatures higher than the circulated air or any other part of the chamber. Heat is generated directly within the air itself due to its turbulence and friction as it moves. And, as a result . . .



NO POINT IN THIS OVEN CAN EXCEED THE INDICATED AIR TEMPERATURE.

If the external temperature indicator registers +150°C. inside the chamber, it is +150°C. (within ±1°C.) at all points inside the chamber. There are no hot spots, and no cold ones.

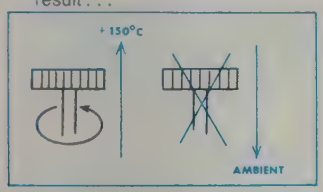
2. Since air movement alone provides heat and since the gradually heating air completely fills the chamber, there are no heat zones and no temperature stratification. As a result . . .



AIR TEMPERATURE RISES SIMULTANEOUSLY IN ALL PORTIONS OF THE CHAMBER.

If a time lag or differential exits, it is extremely small and very difficult to measure.

3. Heat is generated solely by the operation of the motor. As a result . . .



THERE IS A NATURAL INTERLOCK OF BLOWER AND HEAT.

This inherent safety characteristic means that even in the unlikely event of failure of the motor blower system—the only source of heat—chamber temperature will automatically drop. You cannot experience potentially dangerous temperature run-away. Also, should air circulation stop, there is no uncontrolled resistance element rapidly heating to a point above the auto-ignition point of the workload because air is no longer passing over it. And there is no need for a timed purge cycle to remove the hazardous environment resulting from high evaporation of volatiles from the workload when it is first placed in the chamber.

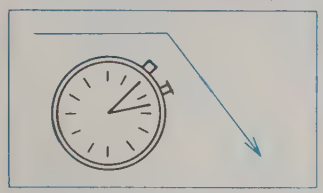
These remarkable characteristics make FRICTION-AIRE inherently safe—have enabled some units to be listed by Underwriters' Laboratories for Class 1, Group D service! But besides safety, FRICTION-AIRE offers a number of other advantages well worth remembering the next time you need an oven . . .

4. FRICTION-AIRE has no signal-creating electronic components such as switches and power contacts. As a result . . .

OPERATION IS FREE OF RFI

This is important to anyone concerned with life-test work in conjunction with extremely sensitive instrumentation.

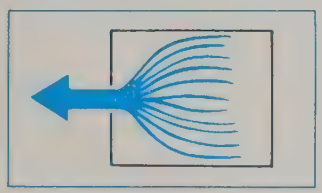
5. While FRICTION-AIRE has a high velocity blower system, the air velocity within the work chamber is fully controllable and is reduced to a practical velocity. As a result . . .



FAST COOL-DOWN RATES ARE AN INHERENT CAPABILITY

Typically, empty oven temperature drops from +150°C. to +50°C. in 30 minutes.

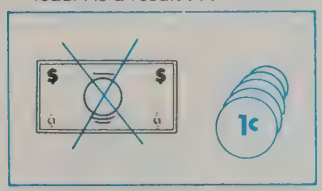
6. Also as a result of this controllable high velocity blower system . . .



MUCH LARGER ELECTRICAL LOADS CAN BE DISSIPATED THAN IS POSSIBLE IN CONVENTIONAL OVENS

This also assures a much greater temperature uniformity when handling a large number of heat dissipating components. This feature is equally important in those applications where the exhausting of volatiles from the work chamber must be accomplished efficiently.

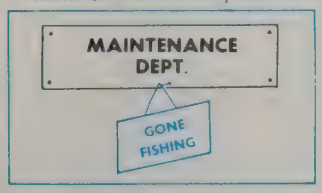
7. FRICTION-AIRE automatically regulates the precise amount of exhaust to balance the input of heat generated by the load. As a result . . .



OPERATION IS EXTREMELY ECONOMICAL

FRICTION-AIRE avoids the need, common in conventional ovens, to set up an artificial heat loss by the exhaust rate, and overcoming this with additional heat over and above that generated by the load. Power savings can be significant—particularly in multiple FRICTION-AIRE installations.

8. FRICTION-AIRE is simple—unbelieveably so. An absolute minimum number of parts can go wrong. As a result . . .



MAINTENANCE IS PRACTICALLY NON-EXISTENT

If ever any FRICTION-AIRE part should fail, chances are excellent that your own personnel can repair or replace it —quickly, easily, and economically.

BLUE M *Electric Company*

BLUE M

FRICTION-AIRE™
PATENTED

with

POWER-O-MATIC 90®
PATENTED

non-electric proportioning control system
and non-electric overtemperature protection

TYPICAL OPERATING CHARACTERISTICS

TEMPERATURE RANGE
15°C. above ambient to +150°C. (+302°F.)

TYPICAL AIR TEMPERATURE UNIFORMITY
at +100°C.: ±0.5°C.

TYPICAL MAXIMUM RATE OF RISE
(No Load)
to +150°C.: 120 minutes

MAXIMUM RATE OF COOLING
(No Load)
to +50°C.: 30 minutes

CONTROL ACCURACY
±0.5°C.

DRIFT
(Over 24-hr. period)
at +50°C ±1°C
at +100°C.: ±0.75°C
at +150°C.: ±0.50°C

MAXIMUM SKIN TEMPERATURE
(at +150°C.)
FRONT: +45°C
DOOR: +32°C
SIDES: +29°C
TOP: +29°C

AVERAGE VELOCITY (Adjustable)
Maximum: 400'/minute
Minimum 100'/minute

TYPICAL MODEL

NOW 3 MODELS U.L. LISTED

REMAIN LESS THAN +215°C. UNDER ANY OPERATING CONDITIONS, ELIMINATING NEED FOR SPECIAL AUXILIARY OVERTEMPERATURE PROTECTION DEVICES.

As the description of FRICTION-AIRE on the previous pages indicates, these chambers are safe. So safe that all three models in this series have been listed by Underwriters' Laboratories for Class 1, Group D work and for operation in Class 1, Group D hazardous locations. This means that these chambers can be utilized in Class 1, Group D areas—irrespective if the ovens themselves are or are not performing Class 1, Group D work. THESE ARE THE FIRST AND ONLY ELECTRIC OVENS TO HAVE THIS LISTING.

As this indicates, this series of FRICTION-AIRE Ovens is ideally suited for several "problem" applications.

The most obvious is for testing/processing hazardous materials in ordnance/munitions installations, as well as paints, solvents, lacquers and other products too numerous to list. Conventional electric hazard-safe chambers, with their heating elements as the heat source, have an inherent hot spot built into them. This represents a potential danger which no amount of engineering by the manufacturer or care by the user can completely eliminate.

FRICTION-AIRE does. There is no central heat source . . . no heating elements where the temperature can exceed the desired operating level. Even spillage of flammables inside the chamber is a minimized danger since any surface the liquid may touch is only as hot as the interior environment.

Amplifying this: tests show that load temperature follows very closely behind chamber temperature. In fact, the load is heated every bit as efficiently as in conventional chambers with greater K.W. If requirements call for processing of hazardous materials over extended periods, the load temperature and chamber temperature will be exactly equal practically all of this time.

Chamber and load reach complete equilibrium—and will stay that way indefinitely until the operating temperature is deliberately changed. Should spillage occur, the spilled material is already at the same temperature as any point it can touch.

Clearly, you cannot specify a safer chamber.

The importance of this in light of the increasing emphasis on safety by such regulatory bodies as OSHA is self-evident. We are primarily concerned with two categories of OSHA: (1) Sub-Part S, concerning electrical devices in hazardous atmospheres and covered by N.E. Code, as amended. FRICTION-AIRE Ovens are built to the recommendations of this Code. (2) Sub-Part H, concerning hazardous internal chamber conditions. As indicated earlier, the inherent FRICTION-AIRE design overcomes many of the safety requirements of this part of NFPA Bulletin 86A and is built to the recommendations of those remaining. FRICTION-AIRE operation is also within pertinent noise regulations.

A new series of FRICTION-AIRE Ovens—designed primarily for general utility laboratory work such as drying, baking and conditioning with fine performance characteristics—is described on the following pages. Other ovens featuring the FRICTION-AIRE principle are available. Write for details.

EQUIPMENT COVERED BY OUR EXCLUSIVE
PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY
BLUE M
SEE PAGE 16

UL®
File No. E53233
Control No. 828N

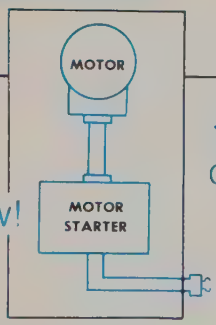
BLUE M

FOR CLASS I, GROUP D SERVICE!

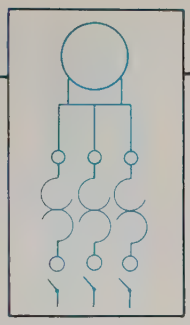
CLASS 1, GROUP D —
THE WAY IT USED TO BE . . .

These are some of the complex (and costly!) external components and connections formerly needed in order for a typical oven to meet Class 1, Group D requirements. Even though this is a Blue M Oven—the finest you could buy at the time—what chance would it ever have had to be U.L. Listed?

And Now!



THIS GIVES YOU ALL THIS



These drawings show all the complexity there is to a typical FRICTION-AIRE Oven for Class 1, Group D service. And imagine how this simplicity lowers your maintenance costs!

1. No point in oven can exceed indicated air temperature
2. Automatic and foolproof interlock between blower and heat source.
3. Built-in overtemperature protection.
4. Automatic exhaust.
5. Mechanical convection.
6. Motor protection and main switch.

TYPICAL CONSTRUCTION FEATURES

INTERIOR: Type 304-2B stainless, including inner face of door and cabinet opening perimeter. Heli-arc welded throughout

EXTERIOR: All-welded heavy gauge cold-rolled steel, reinforced. Stainless steel trim. Primer coat plus attractive baked-on Formica white enamel finish.

DOOR AND HARDWARE: Double wall. Exclusive adjustable no slam, cam action latch and hinges. Bright chrome-plated. Double silicone rubber seals plus stainless steel spring heat barriers around entire door perimeter

INSULATION: 5" thick compressed, special bat type Fiberglas, non-hygroscopic and fireproof

RELIEF PANEL AND SAFETY CAGE: Built into center of back wall

SHELVES: Two, stainless steel, rod type. Stainless, non-tilting type double-runner supports for shelf adjustment on 2" centers.

DIRECT DRIVE MOTOR BLOWER SYSTEM: No belts, bearings, or pulleys. Finest quality, designed especially for efficient operation of this unit as described. 100ft/min. air velocity minimum.

MOTOR STARTER: Positive, safe operation. Class 1, Group D.

READY-READ TEMPERATURE INDICATOR: 3½" diameter, stainless sensing bulb. Dual scale in degrees C. and F.

WIRING: Complete, enclosed, meets amended N.E. Code for Class 1, Group D and Class 2, Groups E, F and G. Approved M.I. cable and fittings throughout. U.L. Listed.

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Max. H.P.	*Approx. Heating Power (Watts)	Cubic Feet Capacity	Shipping Weight Lbs. (Kg.)	Complete Price With OTP
†HS-1002EFG	14 (35)	17 (43)	12 (31)	32 (93)	33 (84)	48 (120)	1.0	500	1 3	280 (127)	$2479.00
HS-1202EFG	25 (63)	20 (51)	20 (51)	42 (106)	39 (98)	63 (159)	2.0	1300	5 2	400 (181)	3175.00
HS-3802EFG	38 (95)	25 (63)	25 (63)	57 (144)	44 (111)	68 (172)	3.0	2000	13 7	520 (236)	5295.00

*Voltage, all models. 208/240/480 V./3 Ph /60 Hz A.C. Chambers will operate satisfactorily on 208 V./3 Ph /60 Hz A.C. when motor is connected for 240 V./3 Ph /60 Hz A.C. Please specify desired operating voltage †Bench model

OPTIONAL AND RECOMMENDED ACCESSORIES — SPARE PARTS

Please give unit model no., and voltage when ordering accessories

MONITORING RECORDERS: Not connected electrically or mechanically to control system. Monitors and provides records only. Mounted on right side, near top of unit. Spring wound. 10 in. diameter. Dual scale. Please order by catalog number shown below.

Instrument price installed . . . . . $540.00 All Ranges

Catalog Number	Temperature Range	Chart Drive Rotation	*Additional Charts
CO2A-2-11	+100°F — +450°F +40°C. — +230°C	1 Day	C10A-2-5 C10A-2-7
CO2A-2-12	+100°F — +450°F +40°C — +230°C	7 Day	C10A-2-6 C10A-2-8

*Additional charts . . . . . $9.00 Box 100 Charts

EXTRA SHELVES: As described above

For Model HS-1002EFG:
Specify Part No. MO4-A115 . . . . . $42.00 Each

For Model HS-1202EFG
Specify Part No. MO4-A117 . . . . . $56.00 Each

For Model HS-3802EFG.
Specify Part No. MO4-A140 . . . . . $144.00 Each

OPTIONAL GRAVITY CONVECTION: Special stainless solid side walls installed over standard perforated side walls Easily removed for reconversion to mechanical air-flow. Limit chamber operation to +125°C

For Model HS-1002EFG: Part No. 142A-01 . . . . . $55.00/Set

For Model HS-1202EFG: Part No. 142B-01 . . . . . $89.00/Set

For Model HS-3802EFG: Part No. 142C-01 . . . . . $107.00/Set

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly

BLUE M

FRICTION-AIRE™ PATENTED with POWER-O-MATIC 60® PATENTED

non-electric proportioning control system, non-electric overtemperature protection and Max-Set overtemperature protection

TEMPERATURE RANGE
15°C. above ambient to +204°C. (+400°F.)

LONG TERM STABILITY
±0.5°C.

TYPICAL AIR TEMPERATURE UNIFORMITY
Up to +100°C.: ±0.25°C.
Over +100°C.: ±0.5°C.

TYPICAL MAXIMUM RATE OF RISE
(No Load)
To +204°C.: Approx. 90 minutes

MAXIMUM RATE OF COOLING
(No Load)
To +50°C.: Approx. 30 minutes

DECIBELS
(Oven operating in normal manner, door closed)
80 DBS maximum

TYPICAL FLOOR MODEL

BENCH MODEL

NEW . . . 3 MODELS WITH PERFORMANCE CHARACTERISTICS TO SATISFY THE TOUGHEST LABORATORY/PRODUCTION NEEDS

BENCH AND FLOOR MODELS WITH VERSATILE +204°C. RANGE OFFER ±0.25°C. UNIFORMITY AND ±0.5°C. STABILITY

With the introduction of these new chambers, Blue M has extended the remarkable FRICTION-AIRE operating principle to include ovens with performance capabilities that easily meet the requirements of even the most demanding test, research or production specialist. As the operating data at left verify, these chambers offer truly outstanding uniformity and long-term stability characteristics. This makes them an excellent choice for such critical service as life-testing parts and components over extended periods. Yet their very competitive price enables them to fit comfortably into modest laboratory budgets, making them practical for such utilitarian work as drying, baking and conditioning.

And being FRICTION-AIRE Ovens, these new chambers are safe. Inherently so. They offer all the unique safeguards of design and operation described on pages 18 and 19— plus the many advanced chamber construction features described on the opposite page. These include a special sliding drawer upon which the control panel and all control instrumentation are mounted. This provides immediate access to any component which might require inspection.

The first FRICTION-AIRE Ovens were introduced in 1972. In the intervening years they have been proven in installations of all types—many involving extremely hazardous applications. Now, with the development of the fine chambers offered here, Blue M enables any laboratory concerned with excellent operation (and safety) to specify an oven without equal.

For hazardous applications where safety is the *prime* consideration, we recommend the series of FRICTION-AIRE Ovens described on the previous pages which are the only electric ovens listed by Underwriters' Laboratories, for Class 1, Group D service.

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY

SEE PAGE 16

BLUE M

GENERAL SPECIFICATIONS AND PRICES

INTERIOR: Type 304, 18-8 stainless, including inner face of door(s) and cabinet opening perimeter. Heli-arc welded throughout.

EXTERIOR: All-welded heavy gauge cold rolled steel, reinforced. Baked-on FORMICA white enamel. Note: Exterior and interior chambers employ specially designed barriers to minimize heat conduction between joining faces.

ELAPSED TIME METER: Shows number of hours oven has actually operated. (See page 13.)

MAX-SET BACK-UP OVERTEMPERATURE PROTECTION: Safeguards workloads and equipment. (See page 12.)

DOOR(S) AND HARDWARE: Double wall. Exclusive adjustable no-slam, cam action latch and chrome-plated hinges. Double silicone rubber seals plus stainless steel spring heat barriers around entire door perimeter. All models with working chambers larger than 25" wide I.D. have two doors but no center mullion. Others have one door.

AIR CIRCULATION: Quality ball bearing motor and balanced multi-bladed blower designed especially for FRICTION-AIRE Ovens. Circulate heated air horizontally across working chamber for uniform heat distribution.

SHELVES: Two, nickel-plated wire or expanded steel, depending on model. Comparable electro-polished stainless shelves optional. Stainless non-tilting type brackets for shelf adjustment on 2" centers.

READY-READ TEMPERATURE INDICATOR: 3½" diameter —for easier, more efficient operation. Dual scale in degrees C. and F.

INSULATION: Fiberglas, minimum 4" thick, non-hygroscopic, fireproof.

NEON PILOT LAMP: Red; denotes unit operation.

WIRING: Complete, totally enclosed. Terminal box. Meets amended N.E. Code and NEMA standards.

BENCH MODEL

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Max. H.P.	**Approx. Heating Power (Watts)	Cubic Feet Capacity	Shipping Weight Lbs. (Kg.)	Complete Price With OTP	*Optional Cabinet Type Floor Stand (Cat. No.)
FA-252EFG	25 (63)	20 (51)	18 (45)	40 (101)	32 (80)	49 (128)	2.0	1400	5.2	600 (272)	$1775.00	(FS-193) $125.00

*Addition of floor stand raises unit approx 21"

FLOOR MODELS

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Max. H.P.	**Approx. Heating Power (Watts)	Cubic Feet Capacity	Shipping Weight Lbs. (Kg.)	Complete Price With OTP
FA-332EFG	25 (63)	20 (51)	36 (90)	40 (101)	32 (80)	75 (190)	3.0	2000	10 0	1000 (454)	$2755.00
FA-1402EFG	48 (120)	24 (61)	34 (86)	63 (159)	36 (90)	73 (185)	5.0	3000	22.6	1200 (545)	3790.00

**Voltage, all models 208/240/480 V./3 Ph./60 Hz. A.C. Chambers will operate satisfactorily on 208 V./3 Ph./60 Hz. A.C. when motor is connected for 240 V./3 Ph./60 Hz. A.C. Please specify desired operating voltage

OPTIONAL AND RECOMMENDED ACCESSORIES — SPARE PARTS — FOR ALL MODELS

*Recording and Indicating Thermometers (Choice of 2 Available for Each Oven) Part Number	Temperature Range	Chart Rotation	**Extra Charts 100/Box	Lead-in Port and Cover	Built-in Automatic Program Timers. To Shut Off oven	Casters 4" Dia., Hard Rubber Swivel
CO2A-2-3	+40°C. to +230°C.	1 Day	C10A-2-7	3" dia., centered in back wall All models. Cat. No. POR-100C $45.00 Installed	Part No. C12A-1, 24 Hr. $65.00 Installed	Part No. CA-401 $105.00 Set of 4, Installed
CO2A-2-4	+40°C. to +230°C.	7 Day	C10A-2-8		Part No. C12A-3, 7 Day $85.00 Installed	

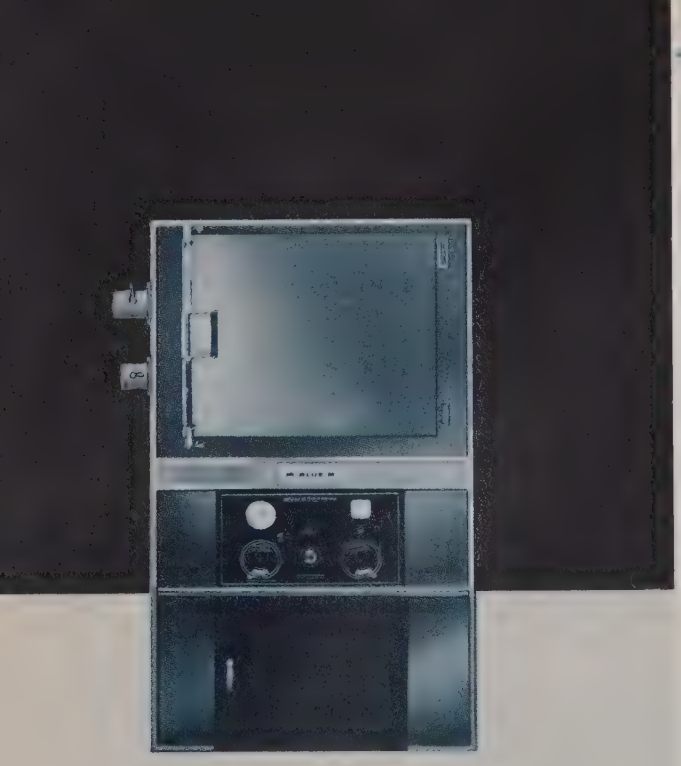
*Installed Price $385.00 all ranges
**Additional charts $9.00/Box

Instrument bracket-mounted on right side near top. Adds approx. 17" overall width of unit

NOTE: When this instrument is ordered, standard temperature indicator is not supplied

Double Glass Observation Panels. Clear Tempered Glass—Built Into Center of Door. For delivery with unit only. Series Number	Catalog Number	Viewing Area (Inches)	Price Installed	Extra Shelves. As Described Above, with 2 Stainless Brackets. Nickel-Plated Steel: Oven I.D.	Part Number	Price Each	Stainless Steel: Part Number	Price Each
FA-252	GPA-101 or GPA-101X	9¼ W. x 12¾ H / 12¾ W. x 9¼ H	$95.00	25" x 20"	MO4-A217	$28.00	MO4-A117	$56.00
FA-332	GPA-103	13 W. x 19½ H	115.00	25" x 20"	MO4-A217	$28.00	MO4-A117	$56.00
†FA-1402				48" x 24"	MO4-B203	62.00	MO4-B124	98.00

†Units with 2 doors. Specify if 2 viewing areas are desired.



TYPICAL BENCH MODEL
(On Optional Floor Stand)

TYPICAL FLOOR MODEL

BLUE M

Horizontal Air-Flow MECHANICAL CONVECTION OVENS *with* POWER-O-MATIC 60®

PATENTED

saturable reactor proportioning control system and built-in overtemperature protection

INCOMPARABLE—

PERFORMANCE . . .

RELIABILITY . . .

STYLING . . .

These are—without doubt—the finest electric ovens ever offered to the scientific and industrial communities. We took our most popular POWER-O-MATIC 60 reactor-controlled mechanical convention ovens—already accepted as the standard for quality and performance—and scrapped them. Literally. Then utilizing their best features and starting from the ground up, we engineered a group of ovens that were far better than any we had had before. We didn't just re-design existing equipment . . . we didn't just give old models a new face. We took proven design concepts and re-engineered them into the radically superior ovens we proudly present here.

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY

SEE PAGE 16

BLUE M

TWO TEMPERATURE RANGES
5°C. above ambient to +204°C. (+400°F.)
15°C. above ambient to +343°C. (+650°F.)

CHOICE OF POPULAR SIZES
1.6, 4.1, 5.8, 10.0, 19.0 and 24.0 cu. ft.

31 SEPARATE MODELS
Bench and Floor Types . . . Including 4 All-New Models

BUILT-IN MAX-SET OVERTEMPERATURE PROTECTION

ONE-PASS AIR-FLOW SYSTEM

UNMATCHED PERFORMANCE
Control Accurancy: ±0.5°C.
Setability: ±1.0°C.
Repeatablity: ±0.5°C.
Air Temperature Uniformity: ±1% of set point (with no exhaust)
(9-#20 gauge 1/C Thermocouples, 2" from all internal surfaces, dials calibrated)

Excellent performance, unmatched reliability, and distinctive styling all contribute towards making these new Blue M Ovens far and away the finest units of their kind on the market today. Because of their many unique design features, they are especially recommended for any application where processing to critical reliability and temperature control standards are basic criteria. This includes such work as life-testing exotic parts and components as well as drying, baking, and conditioning. They are equally well suited for both research and production applications.

These ovens feature the patented POWER-O-MATIC 60 Saturable Reactor Proportioning Control System. This unique Blue M development has earned the respect and admiration of customers and competition alike over the past decade. It is acknowledged as the ultimate in temperature controls for simplicity, performance and reliability.

The POWER-O-MATIC 60 Control provides true straight-line, infinitely proportional performance automatically. You simply set the control dial for the desired temperature—and forget about it. POWER-O-MATIC 60 does the work—and takes out the worry—of providing a degree of temperature regulation unsurpassed by even costly potentiometric instrumentation. Control accuracy is ±0.5°C. . . . setability is ±1.0°C . . . repeatability is ±0.5°C. An integral part of the control is the patented Memory Ring® Temperature Calibrating Dial, the exclusive feature that "remembers" every calibration factor for 100% reproducibility of desired temperatures. New dual scale calibrated in °C. and °F. designed to permit instant change from one to the other. Dial lock prevents inadvertent changing of temperature setting.

Details of construction on these ovens are shown on the next page. All are worthy of units of this high caliber, but some warrant special attention because of the particularly significant contribution they make to the overall operational efficiency of these chambers.

The control panel and practically all control components, for example, are mounted on a special sliding drawer. This permits stacking of bench models to save floor space. The operator simply loosens four special fasteners at panel corners, and pulls the entire assembly forward for complete access to any part that may require inspection. As the illustration shows, Blue M puts the parts where you want them—at your fingertips!

Now standard on these ovens is Blue M's exclusive, new MAX-SET™ Overtemperature Protection. Described fully on page 14, this unique safeguard protects the chamber and workload against an excessive temperature rise, and features time-delay circuitry which prevents nuisance tripping. Also included as standard is an Elapsed Time Meter (described on page 15) and a one-pass air-flow system described on the following page.

Improved instrumentation arrangement on new control panel simplifies operation. All instruments are large and easy to read, and are clearly identified for easy operation. These and such other quality features as all-stainless interiors, rugged welded construction, and heavy insulation assure that these ovens will give years of dependable, maintenance-free service.

These new ovens also offer a smart, modern appearance. It was only natural, since we were re-engineering the inside, to pay special attention to the outside as well. The appearance of these ovens reflects their superior performance . . . complements the decor of any up-to-date laboratory or production department.

There are a number of optional accessories to extend the operational flexibility and convenience of these units even more. They are described on the next page.

GENERAL SPECIFICATIONS

INTERIOR: Type 304, 18-8 stainless, including inner face of door(s) and cabinet opening perimeter.

EXTERIOR: All-welded heavy gauge cold rolled steel, reinforced. Baked-on light blue enamel. Note: Exterior and interior chambers employ specially designed barriers to minimize heat conduction between joining faces.

ELAPSED TIME METER: Shows number of hours oven has actually operated. (See page 15.)

MAX-SET OVERTEMPERATURE PROTECTION: Safeguards workloads and equipment. (See page 14.)

READY-READ TEMPERATURE INDICATOR: 3½" diameter —for easier, more efficient operation. Dual scale in degrees C. and F

ADJUSTABLE ONE-PASS AIR-FLOW SYSTEM: Air passes over heaters and through chamber only once if necessary. Permits almost 100% exhaust of fumes. If high exhaust is needed, higher K.W. rating may be required to obtain maximum temperature. Exhaust is damper-controlled.

DOOR(S) AND HARDWARE: Double wall. Exclusive adjustable no-slam, cam action latch and chrome-plated hinges. Double silicone rubber seals plus stainless steel spring heat barriers around entire door perimeter. All models with working chambers larger than 25" wide I.D. have two doors but no center mullion. Others have one door.

ETERNA HEATER BANKS: Black-Heat; "Controlled" low watt density. Shielded. No radiant heat. Assure years of service

BENCH MODELS

TEMPERATURE RANGE: TO +204°C. (+400°F.)

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Total KVA	Voltage 60 Hz. A.C. 1 Phase	Cubic Feet Capacity	Shipping Weight Lbs. (Kg.)	Complete Price With OTP	*Optional Cabinet Type Floor Stand (Cat. No.)
POM-143A-1 POM-143B-1 POM-143C-1	14 (35)	14 (35)	14 (35)	29 (73)	26 (65)	43 (108)	1 5	120 V 208 V 240 V	1 6	280 (127)	$1095.00 1150.00 1095.00	(FS-191) ($95.00)
POM-203A-1 POM-203B-1 POM-203C-1	20 (51)	18 (45)	20 (51)	35 (88)	30 (76)	49 (123)	2 8	120 V 208 V 240 V	4 1	400 (181)	1330.00 1370.00 1330.00	(FS-192) $110.00
POM-253B-1 POM-253C-1	25 (63)	20 (51)	20 (51)	40 (101)	32 (80)	49 (123)	4 2	208 V 240 V	5 8	520 (236)	1540.00 1475.00	(FS-193) 125.00

TEMPERATURE RANGE: TO +343°C. (+650 F.)

POM-146A-1 POM-146B-1 POM-146C-1	14 (35)	14 (35)	14 (35)	29 (73)	26 (65)	43 (108)	2 8	120 V 208 V 240 V	1 6	280 (127)	$1120.00 1195.00 1145.00	(FS-191) $95.00
POM-206B-1 POM-206C-1	20 (51)	18 (45)	20 (51)	35 (88)	30 (76)	49 (123)	3.9	208 V 240 V	4 1	400 (181)	1450.00 1365.00	(FS-192) 110.00
POM-256B-1 POM-256C-1	25 (63)	20 (51)	20 (51)	40 (101)	32 (80)	49 (123)	5 2	208 V 240 V	5 8	520 (236)	1625.00 1540.00	(FS-193) 125.00

*Addition of floor stand raises unit approx. 21"

OPTIONAL AND RECOMMENDED ACCESSORIES — SPARE PARTS

Please give unit model no. and voltage when ordering accessories

Series Number	*Recording and Indicating Thermometers (Choice of 2 Available for Each Oven) Part Number	Temperature Range	Chart Rotation	**Extra Charts 100/Box	Lead-in Port and Cover	Built-in Automatic Program Timers. To Shut Off Oven	Casters 4" Dia., Hard Rubber Swivel
POM-143 POM-203 POM-253	CO2A-2-3 CO2A-2-4	+40°C. to +230°C. +40°C. to +230°C.	1 Day 7 Day	C10A-2-7 C10A-2-8	3" dia., centered in back wall All models	Part No. C12A-1, 24 Hr $65.00 Installed	Part No. CA-401
POM-146 POM-206 POM-256	CO2A-2-5 CO2A-2-6	+40°C. to +340°C. +40°C. to +340°C.	1 Day 7 Day	C10A-2-11 C10A-2-12	Cat. No. POR-100C $45.00 Installed	Part No. C12A-3, 7 Day $85.00 Installed	$105.00 Set of 4, Installed

*Installed Price $385.00 all ranges
**Additional charts $9.00/Box

Instrument bracket-mounted on right side near top. Adds approx. 17" overall width of unit

NOTE: When this instrument is ordered, standard temperature indicator is not supplied

Double Glass Observation Panels. Clear Tempered Glass—Built Into Center of Door *(For delivery with unit only)*				Extra Shelves. As Described Above, with 2 Stainless Brackets				
				Nickel-Plated Steel			Stainless Steel	
Series Number	Catalog Number	Viewing Area (Inches)	Price Installed	Oven I.D.	Part Number	Price Each	Part Number	Price Each
POM-143 & 146	GPA-100	6½ W. x 8 H.	$75.00	14" x 14"	MO4-A215	$24.00	MO4-A115	$42.00
POM-203 & 206	GPA-101	9¼ W. x 12¾ H.	$95.00	20" x 18"	MO4-A216	$27.00	MO4-A116	$47.00
POM-253 & 256	or GPA-101X	12¾ W. x 9¼ H.		25" x 20"	MO4-A217	$28.00	MO4-A117	56.00

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly

SEE ADDITONAL ACCESSORIES AND SPARE PARTS ON PAGES 164-167

AND PRICES

INSULATION: Fiberglas, minimum 4" thick, non-hygroscopic, fireproof.

AIR CIRCULATION: Quality ball bearing motor and balanced multi-bladed blower designed especially for long service at elevated temperatures. Circulate heated air horizontally across working chamber for uniform heat distribution

SHELVES: Two, nickel-plated wire or expanded steel, depending on model. Comparable electro-polished stainless shelves optional. Stainless non-tilting type brackets for shelf adjustment on 2" centers

VOLTMETER: Indicates voltage on heating element.

NEON PILOT LAMP: Red; denotes unit operation.

WIRING: Complete, totally enclosed. Terminal box. Meets amended N.E. Code and NEMA standards.

FLOOR MODELS

TEMPERATURE RANGE: TO +204°C. (+400°F.)

*Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Total KVA	Voltage 60 Hz. A.C. 1 Phase	Cubic Feet Capacity	Shipping Weight Lbs. (Kg.)	Complete Price With OTP
POM-133B-1	38	20	25	53	32	62	5.5	208 V	10.0	850	$2240.00
POM-133C-1	(95)	(51)	(63)	(133)	(80)	(157)		240 V		(386)	2185.00
POM-333B-1	25	20	38	40	32	75	5.5	208 V	10.0	875	2240.00
POM-333C-1	(63)	(51)	(95)	(101)	(80)	(190)		240 V		(397)	2185.00
POM-1403B-1	48	24	36	63	36	73	6.0	208 V	24.0	1030	3290.00
POM-1403C-1	(120)	(61)	(90)	(159)	(90)	(185)		240 V.		(467)	3175.00
POM-1503B-1	37	25	37	53	38	75	9.8	208 V.	19.0	1000	2685.00
POM-1503C-1	(93)	(63)	(93)	(133)	(95)	(190)		240 V.		(460)	2570.00

TEMPERATURE RANGE: TO +343°C. (+650 F.)

POM-136B-1	38	20	25	53	32	62	9.5	208 V.	10.0	850	$2375.00
POM-136C-1	(95)	(51)	(63)	(133)	(80)	(157)		240 V		(386)	2295.00
POM-336B-1	25	20	38	40	32	75	9.5	208 V	10.0	875	2375.00
POM-336C-1	(63)	(51)	(95)	(101)	(80)	(190)		240 V.		(397)	2295.00
POM-1406B-1	48	24	36	63	36	73	9.8	208 V.	24.0	1030	3460.00
POM-1406C-1	(120)	(61)	(90)	(159)	(90)	(185)		240 V		(467)	3335.00
POM-1506B-1	37	25	37	53	38	75	9.8	208 V	19.0	1000	2990.00
POM-1506C-1	(93)	(63)	(93)	(133)	(95)	(190)		240 V.		(460)	2865.00

*All models have two doors but no center mullion, except Models POM-333B&C-1 and POM-336B&C-1 which have one door

OPTIONAL AND RECOMMENDED ACCESSORIES — SPARE PARTS

Please give unit model no. and voltage when ordering accessories

Series Number	*Recording and Indicating Thermometers (Choice of 2 Available for Each Oven) Part Number	Temperature Range	Chart Rotation	**Extra Charts 100/Box	Lead-in Port and Cover	Built-In Automatic Program Timers. To Shut Off Oven	Casters 4" Dia., Hard Rubber Swivel
POM-133 POM-333 POM-1403 POM-1503	CO2A-2-3 CO2A-2-4	+40°C. to +230°C. +40°C. to +230°C.	1 Day 7 Day	C10A-2-7 C10A-2-8	3" dia., centered in back wall. All models	Part No. C12A-1 24 Hr. **$65.00** Installed	Part No CA-401 **$105.00** Set of 4 Installed
POM-136 POM-336 POM-1406 POM-1506	CO2A-2-5 CO2A-2-6	+40°C. to +340°C. +40°C. to +340°C.	1 Day 7 Day	C10A-2-11 C10A-2-12	Cat. No. POR-100C **$45.00** Installed	Part No. C12A-3, 7 Day **$85.00** Installed	

*Installed Price **$385.00** all ranges
Additional charts **$9.00/Box

Instrument bracket-mounted on right side near top. Adds approx. 17" to overall width of unit

NOTE: When this instrument is ordered, standard temperature indicator is not supplied

Double Glass Observation Panels, Clear Tempered Glass-Built Into Center of Door(s) *For delivery with unit only.* Series Number	Catalog Number	Viewing Area (Inches)	Price Inst. Per Door	Extra Shelves, As Described Above, With 2 Stainless Brackets — Nickel-Plated Steel: Oven I.D.	Part Number	Price Each	Stainless Steel: Part Number	Price Each
POM-133† & 136†	GPA-102	11" W. x 16⅛ H.	$110.00	38" x 20"	MO4-B202	$48.00	MO4-B116	$78.00
POM-333 & 1403†	GPA-103	13 W. x 19½ H.	$115.00	25" x 20"	MO4-A217	$28.00	MO4-A117	$56.00
POM-336 & 1406†				48" x 24"	MO4-B203	62.00	MO4-B124	98.00
POM-1503† & 1506†				37" x 25"	MO4-A219	75.00	MO4-A141	146.00

†Units with 2 doors. Specify if 2 viewing areas are desired

BLUE M

mechanical convection

Horizontal Air-Flow

Bench Type

MINIATURE BATCH OVENS

with

POWER-O-MATIC 60®
PATENTED

saturable reactor proportioning control system and built-in overtemperature protection

RECOVERY TIME
At +200°C., door open 1 minute: 5 minutes

RUN UP TIME: To +200°C.: 30 minutes

READY-READ TEMPERATURE INDICATOR

NO-SLAM, ADJUSTABLE CAM ACTION LATCH AND HINGES

DESIGNED WITH BLUE M ETERNA HEATERS REMOTE IN TOP SECTION AND SHIELDED

2 TEMPERATURE RANGES
15°C. above ambient to +204°C. (+400°F.)
15°C. above ambient to +300°C. (+572°F.)

MAY BE STACKED TO CONSERVE FLOOR SPACE

STAINLESS STEEL INTERIOR
Including face of door

NO TRANSIENT VOLTAGES DUE TO ARCING CONTACTS

MEMORY RING® TEMPERATURE CALIBRATING DIAL AND DIAL POINTER LOCK
New dual scale in °C. and °F. designed to permit instant change from one to the other at will!

PROVEN CHAMBER DESIGN COMBINED WITH REMARKABLE PERFORMANCE FOR TRULY SUPERB SERVICE

The compact, efficient design of these units—coupled with the inherent reliability of the POWER-O-MATIC 60 Saturable Reactor Control System—makes Blue M Miniature Batch Ovens particularly well suited for any application where reliability and safety are essential. Ovens may be stacked to conserve valuable floor space. Contact factory for details of mounting brackets, etc. Especially valuable for aging, drying, preheating, baking and similar procedures in the electronics, paint, chemical and allied industries. Permit processing of flat or odd shaped workpieces without need for special loading or impeding of air-flow. Straight-line temperature control within a proportional band of 4%—with no cycling, no overshoot on run-up—provides fine degree of accuracy and uniformity: 1.5°C. at +204°C., 2°C. at +300°C.; control tolerance is 1°C. or less. And these tolerances are even closer at lower temperatures! Thermocouple tests available.

Now standard on these ovens is Blue M's exclusive, new MAX-SET™ Overtemperature Protection. Described fully on page 14, this unique safeguard protects the chamber and workload against an excessive temperature rise, and features time-delay circuitry which prevents nuisance tripping.

ONLY POWER-O-MATIC 60 OFFERS THESE OUTSTANDING PERFORMANCE CHARACTERISTICS

RELIABILITY: POWER-O-MATIC 60 Control System has no electronic tubes or amplifiers . . . no photo cells . . . no timers or variacs . . . no relays or switches . . . no potentiometer slidewires . . . no auxiliary devices to wear, burn or replace.

EFFICIENCY: Pin-point temperature control is achieved by placing saturable reactor in series with Blue M Eterna heating elements across electrical power line. Variable D.C. voltage proportional to temperature is fed to reactor from POWER-O-MATIC 60 Control System. Temperature changes are detected by a type 316 stainless steel thermal sensing bulb and mechanical changes are converted to electrical changes by POWER-O-MATIC 60.

SAVINGS: Proportioning power to unit reduces voltage impressed across heating element. Watt density is reduced and heating element life is extended because thermal shock with ordinary on-off cycling is completely eliminated.

SAFETY-DIAL POINTER LOCK: Primary Protection with RANGE-LOCK . . . AT NO ADDED COST. Built-in, this exclusive power limiting feature mechanically locks the control armature to prevent an abnormal rise of set operating temperature irrespective of ruptured thermal system or inadvertent turning of control knob. Dial pointer lock, an added feature, secures temperature setting against accidental change. UNIT CAN BE OPERATED UNATTENDED

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY BLUE M

SEE PAGE 16

BLUE M

GENERAL SPECIFICATIONS AND PRICES

ETERNA ELEMENTS: Black-Heat; "Controlled" low-watt density, even at maximum temperature. Reducing voltage reduces watt density. No thermal shock, no screws or welded parts, **no radiant heat;** continuous elements with external connections, located remote from work chamber for added safety.

VOLTMETER: Power input indication.

CIRCUIT BREAKER: As short circuit protection.

NEON PILOT LAMP: Red, denotes unit operation.

MOTOR: Quality, all-angle heavy duty motor design especially for blower duty and elevated temperatures. Ample horsepower to give long, trouble free service. Has exclusive Blue M vibrationless mounting design.

DEFINITE DIRECTED AIR-FLOW: Multi-bladed blower, statically balanced, circulates tempered air horizontally across working chamber to produce uniform heat distribution. No need for special loading.

AIR INTAKE/EXHAUST/AIR-FLOW: Adjustable. Heated air propelled HORIZONTALLY. Velocity proportioned up to 275 F.P.M. depending on unit style. Snap-in stainless covers.

INTERIOR: All models and inside of door(s) type 304, 18-8 stainless—excellent resistance to heat and corrosion.

EXTERIOR: Heavy gauge cold rolled steel; reinforced with minimum through bracing . . . all welded construction for ruggedness. Finished in attractive durable blue enamel.

MAX-SET OVERTEMPERATURE PROTECTION: Safeguards workloads and equipment. (See page 14.)

DOOR AND HARDWARE: Double wall. Exclusive adjustable no-slam, cam action latch and new chrome-plated hinges maintain positive air-tight seal. Silicone rubber seal.

INSULATION: Minimum 3 in. thick blanket of non-hygroscopic, fireproof, Fiberglas; will not settle or deteriorate.

SHELVES (2): Steel rod type, nickel-plated, adjustable; with double-runner type shelf supports.

READY-READ TEMPERATURE INDICATOR: 3½" diameter—for easier, more efficient operation. Filled system—no gears or hair springs. Stainless sensing bulb. Dual scale in degrees C. and F.

WIRING: Complete, totally enclosed. Simply connect to power line from terminal box provided. Meets N.E. Code, as amended.

TEMPERATURE RANGE: to +204°C. (+400°F.)

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Total KVA	Voltage 60 Hz. A.C. Single Phase	Cubic Feet Capacity	Shipping Weight Lbs. (Kg.)	Complete Price With OTP
POM-563A	19 (48)	17½ (44)	18 (45)	29 (73)	30 (76)	48 (120)	2.6	120 V.	3.4	300 (136)	$1130.00
POM-563B								208 V.			1185.00
POM-563C								240 V.			1130.00

TEMPERATURE RANGE: to +300°C. (+572°F.)

POM-566B	19 (48)	17½ (44)	18 (45)	29 (73)	30 (76)	48 (120)	3.7	208 V.	3.4	300 (136)	$1290.00
POM-566C								240 V.			1215.00

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories.

Series Number	Double Glass Observation Panels. Clear Tempered Glass—Built Into Center of Door (For delivery with unit only.) Catalog Number	Viewing Area (Inches)	Price Installed	*Recording and Indicating Thermometers (Choice of 2 available for each oven) Catalog Number	Temperature Range	Chart Rotation	**Extra Charts 100/Box
POM-563	GPA-101	9¼W x 12¾H	$95.00	CO2A-2-3	+40°C. to +230°C.	1 Day	C10A-2-7
				CO2A-2-4	+40°C. to +230°C.	7 Day	C10A-2-8
POM-566	GPA-101	9¼W x 12¾H	$95.00	CO2A-2-5	+40°C. to +340°C.	1 Day	C10A-2-11
				CO2A-2-6	+40°C. to +340°C.	7 Day	C10A-2-12

* Installed Price $385.00 all ranges
**Additional charts $9.00/Box
NOTE: Recording and Indicating Thermometer is installed on top of oven, right side adjacent to motor facing front. When ordered, standard temperature indicator is not supplied

EXTRA SHELVES: As described above, with 2 stainless brackets.
Part No. MO4-A207 ..... $24.00 Each

CABINET TYPE FLOOR STAND: Elevates unit 27".
Cat. No. FS-146 ..... $110.00 Each

BUILT-IN AUTOMATIC PROGRAM TIMERS
To shut off oven.
Part No. C12A-1, 24 Hour ..... $65.00 Installed
Part No. C12A-3, 7 Day ..... 85.00 Installed

LEAD-IN PORTS: 3" dia. with cover. Center of back wall. Other locations must be specified.
Cat. No. POR-100C ..... $45.00 Installed

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly.

SEE ADDITIONAL ACCESSORIES AND SPARE PARTS ON PAGES 164-167.

BLUE M

mechanical convection

Horizontal Air-Flow INDUSTRIAL BATCH OVENS *with*

POWER-O-MATIC 60® PATENTED

saturable reactor proportioning control system and built-in overtemperature protection

UNMATCHED PERFORMANCE!
Maximum 24-hour drift: ±2°C. as shown by Honeywell Electronik Potentiometer recorder, 20 ga. I/C thermocouples. Recovery time: 5 minutes at +204°C. when door is open one minute at rated voltage.

TEMPERATURE UNIFORMITY
At +100°C.: ±1.0°C.
At +190°C.: ±1.9°C.

TEMPERATURE RANGE: To +316°C. (+600°F.)

MINIMUM TEMPERATURE: 5°C. above ambient with One-Pass Air-Flow operating.

ELAPSED TIME METER

ALL POWER UNDER REACTOR CONTROL NO AUXILIARY ELEMENTS

120 VOLT CONTROL CIRCUIT

DIRECT DRIVE MOTOR/BLOWER SYSTEM

ONE-PASS AIR-FLOW SYSTEM

REMOVABLE INNER CHAMBER SIDE WALLS

CONVENIENT AIR DAMPER REGULATOR

FOR EXTENDED LABORATORY TESTS. UNLIMITED PRODUCTION. Engineered for 10 to 20 years life under normal operating conditions.

MEMORY RING® TEMPERATURE CALIBRATING DIAL AND DIAL POINTER LOCK
New dual scale in °C. and °F. designed to permit instant change from one to the other at will!

RADICALLY IMPROVED! IN DESIGN, IN CONSTRUCTION—FOR SIMPLER, MORE EFFICIENT OPERATION

Ultra-reliability and unexcelled performance is built into these Blue M Industrial Batch Ovens, making them unusually well suited for production runs as well as for the prolonged time/test procedures now common in the research and production departments of the electronics industry, steel, rubber, plastics, etc. Valuable for aging, curing, drying, tempering; coil and armature baking, synthetic finish baking, preheating plastics, curing coated plating racks, core baking, silicone baking, and transformer tests. POWER-O-MATIC 60 straight-line temperature control within a proportional band of 4%—with no cycling, no overshoot on run-up—makes possible this unusual guarantee: Blue M Industrial Batch Ovens will outperform and outlast any unit of the same temperature range and price with regard to work chamber air temperature uniformity at multiple points; temperature drift over extended periods; control performance.

Built-in overtemperature protection, now standard; safeguards valuable workloads and equipment. Elapsed Time Meter indicates exactly how long the oven has operated.

ONLY POWER-O-MATIC 60 OFFERS THESE OUTSTANDING PERFORMANCE CHARACTERISTICS

RELIABILITY: POWER-O-MATIC 60 Control System has no electronic tubes or amplifiers . . . no photo cells . . . no timers or variacs . . . no relays or switches . . . no potentiometer slidewires . . . no auxiliary devices to wear, burn or replace.

EFFICIENCY: Pin-point temperature control is achieved by placing saturable reactor in series with Blue M Eterna heating elements across electrical power line. Variable D.C. voltage proportional to temperature is fed to reactor from POWER-O-MATIC 60 Control System. Temperature changes are detected by a type 316 stainless steel thermal sensing bulb and mechanical changes are converted to electrical changes by POWER-O-MATIC 60.

SAVINGS: Proportioning power to unit reduces voltage impressed across heating element. Watt density is reduced and heating element life is extended because thermal shock with ordinary on-off cycling is completely eliminated.

SAFETY-DIAL POINTER LOCK: Primary Protection with RANGE-LOCK . . . AT NO ADDED COST. Built-in, this exclusive power limiting feature mechanically locks the control armature to prevent an abnormal rise of set operating temperature irrespective of ruptured thermal system or inadvertent turning of control knob. Dial pointer lock, an added feature, secures temperature setting against accidental change. UNIT CAN BE OPERATED UNATTENDED.

EQUIPMENT COVERED BY OUR EXCLUSIVE
PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY

SEE PAGE 10

BLUE M

GENERAL SPECIFICATIONS AND PRICES

HOUSING: Double wall, of heavy steel (#14 and #16 ga.). Structural angle reinforce where necessary. Arc and spot welding for rugged strength. Expansion and contraction no problem.

WALLS: Triple side walls—plus all 6 sides insulated with 4 in. Fiberglas to minimize heat loss. Fiberglas is non-hygroscopic, fireproof, has low thermal conductivity.

DOOR(S): Same construction and insulation as housing and walls (extra reinforcements). Exclusive Blue M designed ball bearing type hinges allow easy door swing. Industrial type latch(es) provide positive seal, prevent air leakage. Door(s) overlap generously full height and width.

FINISH: Working chamber and inside of door(s) sprayed with high temperature aluminum paint to protect against chemicals, fumes, etc. Attractive blue enamel exterior.

SHELF SUPPORTS: Angles spaced every 4 in. for all models. Ample support and adjustment.

SHELVES (OPTIONAL): Heavy steel angle iron framing and expanded metal. Support heavy loads. Hi-temp aluminum finish.

DIRECT DRIVE MOTOR/BLOWER: No bearings, pulleys or belts. Extra large, fan-cooled ball bearing motor drives multi-bladed blower directly.

ETERNA ELEMENTS: Black-Heat; "Controlled" low-watt density, even at maximum temperature. Reducing voltage reduces watt density. No thermal shock, no screws or welded parts, **no radiant heat;** continuous elements with external connections, located remote from work chamber.

MAX-SET OVERTEMPERATURE PROTECTION: Safeguards workloads and equipment. (See page 14.)

ELAPSED TIME METER: Shows total number of hours oven has actually operated.

ADJUSTABLE ONE-PASS AIR-FLOW SYSTEM: Air passes over heaters and through chamber only once if necessary. Permits almost 100% exhaust of fumes. If high exhaust needed, higher K.W. rating may be required to obtain maximum temperature. Contact factory. Fresh air enters intake with adjustable cover. Exhaust capacity up to 150 CFM, depending on model.

SIDE-MOUNTED AIR DAMPER REGULATOR: Easy to reach and adjust. Simplifies operation.

REMOVABLE INNER CHAMBER SIDE WALLS. For easy cleaning or making modifications.

READY-READ TEMPERATURE INDICATOR: 3½" diameter —for easier, more efficient operation. Dual scale in degrees C. and F.

SLANTED CONTROL PANEL: Angled towards operator for easy viewing of all controls. Switch automatically shuts off power when panel is opened.

SILICONE DOOR GASKETING: Improves sealing. Long lasting—won't harden or crack.

VOLTMETER: Power input indication.

NEON PILOT LAMP: Red, denotes unit operation.

WIRING: All wiring complete and enclosed. Ovens ready for power hook-up. Meets N.E. Code, as amended.

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Total KVA	†Run-up Time Oven Empty	Voltage 60 Hz. A.C. 3 Phase	Shipping Weight Lbs. (Kg.)	Complete Price With OTP (Less Shelves)	Shelves Price Each (Part No.)
POM-106E POM-106F POM-106G	19 (48)	20 (51)	39 (98)	37 (93)	31 (78)	74 (185)	9.2	70 min.	208 V. 240 V. 480 V.	900 (408)	$2230.00 2125.00 2195.00	(MO4-B301) $22.00
POM-166E POM-166F POM-166G	24 (61)	24 (61)	48 (120)	46 (116)	37 (93)	82 (208)	10.5	90 min.	208 V. 240 V. 480 V.	950 (431)	2790.00 2650.00 2680.00	(MO4-B302) $27.00
POM-246E POM-246F POM-246G	36 (90)	24 (61)	48 (120)	56 (142)	37 (93)	82 (208)	12.7	90 min.	208 V. 240 V. 480 V.	1500 (681)	3195.00 3090.00 3120.00	(MO4-B303) $34.00
*POM-326E *POM-326F *POM-326G	48 (120)	24 (61)	48 (120)	70 (177)	37 (93)	82 (208)	13.7	105 min.	208 V. 240 V. 480 V.	1950 (885)	4060.00 3830.00 3970.00	(MO4-B305) $44.00

*Has two doors, but no center mullion. All others have single door. †Intake and exhaust ports closed
NOTE: Series capacities and (shelf positions): POM-106. 10 cu. ft. (8); POM-166. 16 cu. ft. (10); POM-246. 24 cu. ft. (10); POM-326. 32 cu. ft. (10)

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories

Series Number	Double Glass Observation Panels. Clear tempered glass—built in center of door(s)† (For delivery with unit only) Catalog Number	Viewing Area (Inches)	Price Installed Per Door	*Recording and Indicating Thermometers (Choice of 2 available for each oven) Part Number	Temperature Range	Chart Rotation	**Extra Charts 100/Box
POM-106 POM-166 POM-246 POM-326†	GPA-103	13W x 19½H	$115.00	CO2A-2-5 CO2A-2-6	+40°C. to +340°C. +40°C. to +340°C.	1 Day 7 Day	C10A-2-11 C10A-2-12

*Installed Price: $385.00 all ranges. **Additional charts: $9.00/Box. †Unit with 2 doors. Specify if 2 viewing areas are desired
NOTE: Instrument bracket-mounted on right side near top. Adds about 17" to overall width of unit. When this instrument is ordered, standard temperature indicator is not supplied

BUILT-IN AUTOMATIC PROGRAM TIMERS

To control operating periods, please specify if timer is to shut off heat and blower, or heat only.

Part No. C12A-1, 24 Hour..... $65.00 Installed
Part No. C12A-3, 7 Day..... 85.00 Installed

SEE ADDITIONAL ACCESSORIES AND SPARE PARTS ON PAGES 164-167

LEAD-IN PORTS 3" dia. with cover. Centered in areas indicated.

Cat. No. POR-100A, Right Wall..... $45.00 Installed
Cat. No. POR-100C, Back Wall..... 45.00 Installed

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly.

BLUE M

mechanical convection

Horizontal Air-Flow

SEMI-HAZARD SAFE OVENS

with

POWER-O-MATIC 60® PATENTED

saturable reactor proportioning control system and built-in overtemperature protection

HORIZONTAL MECHANICAL AIR-FLOW, plus UNIQUE AIR-FLOW/DAMPER/INTAKE DESIGN FOR SAFER OPERATION

a) Full Open: 100% exhaust—0% recirculation (a true one pass air-flow design)
b) Full Closed: 25% exhaust—75% recirculation (factory set to insure minimum exhaust)

TEMPERATURE UNIFORMITY
At +100°C.: ±0.75°C.
At +200°C.: ±2.0°C.

RECOVERY TIME
At +200°C., door open 1 minute: 9 minutes

TEMPERATURE RANGE: To +204°C. (+400°F.)

MINIMUM TEMPERATURE: 5°C. above ambient with One-Pass Air-Flow operating.

SEPARATE HEATER SWITCH
Blower may be operated independently of heaters

LOW-LOW WATT ETERNA HEATERS COVERED BY SOLID PLATE

READY-READ TEMPERATURE INDICATOR

ALL STAINLESS STEEL. TYPE 304, 18-8 INTERIOR

MEMORY RING® TEMPERATURE CALIBRATING DIAL AND DIAL POINTER LOCK
New dual scale in °C. and °F. designed to permit instant change from one to the other at will!

SAFETY AND RELIABILITY FOR SEMI-HAZARDOUS SERVICE AT LOW COST

Here is an economical, reliable Semi-Hazard Safe Oven ideally suited for applications where open sparking must be avoided, but where the danger of fire or explosion is not sufficient to warrant the expense of a fully hazard-safe unit.

Equipped with the patented POWER-O-MATIC 60 Saturable Reactor Proportioning Control System without arcing components, relays and other hazard-prone devices, this unit incorporates a number of important design and engineering features that prevent sparking during normal operation. Considerably less expensive than units providing full hazard-safe operation, this oven provides adequate protection including built-in overtemperature protection against certain abnormal conditions—yet assures excellent reliability and dependability unsurpassed by conventional ovens costing hundreds of dollars more!

Features include a unique air-flow system with external damper control which proportions the ratio of exhaust air to recirculated air. When full open the heated air is convected only once over the heaters before it is exhausted outward or through a fume hood exhaust. There is no possible build up of a hazardous atmosphere

Even when full closed a 25% positive exhaust is maintained with 75% recirculation. This mechanical one-pass air-flow design, by providing a positive means of expelling volatile fumes, is superior to standard gravity convection units described as fully hazard-safe.

In addition, surface temperature of the heating elements in this Blue M unit is much closer to actual cabinet operating temperature than in gravity convection units—eliminating the inherent hazard of heater banks operating at much higher temperatures than required in order to reach specified chamber temperature. These features plus such others as sealed mercury switches and Class 1—Group D Motor result in a cabinet offering safety and definite economy.

For the ultimate in safety, see our patented FRICTION-AIRE™ Ovens—the only electric ovens with **no** heating elements—on pages 18-23.

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY BLUE M

SEE PAGE 10

BLUE M

ONLY POWER-O-MATIC 60 OFFERS THESE OUTSTANDING PERFORMANCE CHARACTERISTICS

RELIABILITY: POWER-O-MATIC 60 Control System has no electronic tubes or amplifiers . . . no photo cells . . . no timers or variacs . . . no relays or switches . . . no potentiometer slidewires . . . no auxiliary devices to wear, burn or replace.

EFFICIENCY: Pin-point temperature control is achieved by placing saturable reactor in series with Blue M Eterna heating elements across electrical power line. Variable D.C. voltage proportional to temperature is fed to reactor from POWER-O-MATIC 60 Control System. Temperature changes are detected by a type 316 stainless steel thermal sensing bulb and mechanical changes are converted to electrical changes by POWER-O-MATIC 60.

SAVINGS: Proportioning power to unit reduces voltage impressed across heating element. Watt density is reduced and heating element life is extended because thermal shock with ordinary on-off cycling is completely eliminated.

SAFETY-DIAL POINTER LOCK; Primary Protection with RANGE-LOCK . . . AT NO ADDED COST. Built-in, this exclusive power limiting feature mechanically locks the control armature to prevent an abnormal rise of set operating temperature irrespective of ruptured thermal system or inadvertent turning of control knob. Dial pointer lock, an added feature, secures temperature setting against accidental change. UNIT CAN BE OPERATED UNATTENDED.

For full description of POWER-O-MATIC 60 and RANGE-LOCK operation, see catalog pages 10-15.

GENERAL SPECIFICATIONS AND PRICES

BUILT-IN OVERTEMPERATURE PROTECTION: Provides safety for workload and equipment. Instrumentation cannot be tampered with externally once set. Design avoids accidental change. Once tripped, OTP can be reset externally without altering original setting. Trip point factory-set to customer's specifications or at maximum oven temperature if not specified.

ETERNA ELEMENTS: Black-Heat; "Controlled" low-watt density, even at maximum temperature. Reducing voltage reduces watt density. No thermal shock, no screws or welded parts, **no radiant heat;** continuous elements with external connections, located remote from work chamber; covered by solid plate.

VOLTMETER: Power input indication.

NEON PILOT LAMP: Red, denotes unit operation.

SEALED MERCURY SWITCHES: Place unit and blower into operation.

MOTOR: Totally enclosed, ball bearing, explosion resistant, Class 1, Group D. Separate heater switch allows blower to operate independently of heaters.

DEFINITE DIRECTED AIR-FLOW: Multi-bladed non-spark alloy blower statically balanced circulates heated air horizontally across working chamber to produce uniform heat distribution.

AIR INTAKE/EXHAUST/DAMPER: Large fresh air intake. The extra large stainless steel exhaust and damper is externally adjustable to control the ratio of exhaust air to recirculated air.

INTERIOR: Type 304, 18-8 stainless steel including face of door and door perimeter . . . excellent resistance to corrosion and heat.

EXTERIOR: Heavy gauge cold rolled steel; reinforced with minimum through bracing . . . all welded construction for ruggedness. Attractive durable FORMICA white enamel finish.

INSULATION: Minimum three inch thick blanket of non-hygroscopic, fireproof, Fiberglas wool; will not settle.

DOOR AND HARDWARE: Double wall. Exclusive adjustable no-slam, cam action latch and new chrome-plated hinges maintain positive air-tight seal. Silicone rubber seal.

SHELVES (2) AND BRACKETS: Expanded with tubular type framing, electro-polished stainless. With stainless double-runner type shelf brackets. Adjustable on 2 in. centers.

READY-READ TEMPERATURE INDICATOR: 3½" diameter —for easier, more efficient operation. Dual scale in degrees C. and F.

WIRING: Complete, totally enclosed. All connections soldered for greater permanency. Terminal box provided. Simply connect to power line. Meets N.E. Code, as amended.

Model Number	*Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Total KVA	Voltage 60 Hz. A.C. Single Phase	Shipping Weight Lbs. (kg.)	Complete Price With OTP
POM-223B	24	20	30	39	32	53	9.1	208 V.	475	$3580.00
POM-223C	(61)	(51)	(76)	(98)	(80)	(133)		240 V.	(215)	3355.00

*Ovens have a capacity of 8.3 cu. ft.

OPTIONAL AND RECOMMENDED ACCESSORIES — SPARE PARTS

Please give unit model no., and voltage when ordering accessories

EXTRA SHELVES AND BRACKETS: As described above.
Stainless steel: Part No. MO4-B109 ..... $65.00/set

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly.

SEE ADDITIONAL ACCESSORIES AND SPARE PARTS ON PAGES 164-167.

BLUE M

GRAVITY CONVECTION OVENS

with

POWER-O-MATIC 60® PATENTED

saturable reactor proportioning control system and built-in overtemperature protection

TEMPERATURE RANGE
15°C. above ambient to +343°C. (+650°F.)

BUILT-IN MAX-SET OVERTEMPERATURE PROTECTION

READY-READ TEMPERATURE INDICATOR

NO-SLAM, ADJUSTABLE CAM ACTION LATCH AND HINGES

BAKED ON ENAMEL FINISH

IDEAL FOR EXTENDED LABORATORY TESTS
Designed for 10 to 20 years life under normal operating conditions

NO TRANSIENT VOLTAGES DUE TO ARCING CONTACTS

MEMORY RING® TEMPERATURE CALIBRATING DIAL AND DIAL POINTER LOCK
New dual scale in °C. and °F. designed to permit instant change from one to the other at will!

FOR EXTREMELY ACCURATE TEMPERATURE CONTROL IN STILL AIR—WITH SAFETY

The POWER-O-MATIC 60 Saturable Reactor Control System—inherently reliable and efficient—makes Blue M Gravity Convection Ovens the perfect choice for critical analytical and general laboratory work involving drying, preheating, baking, etc. Straight-line temperature control within a proportional band of 4%—with no cycling, no overshoot on run-up—provides fine degree of accuracy and uniformity in such exacting applications as aging tests in the electronics industry. Vibrationless design without contacts also makes these units suitable for installation of balances and other delicate mechanisms into chamber. Elimination of arcing or flashing components assures safety essential in many laboratories.

Now standard on these ovens is Blue M's exclusive, new MAX-SET™ Overtemperature Protection. Described fully on page 14, this unique safeguard protects the chamber and workload against an excessive temperature rise, and features time-delay circuitry which prevents nuisance tripping.

ONLY POWER-O-MATIC 60 OFFERS THESE OUTSTANDING PERFORMANCE CHARACTERISTICS

RELIABILITY: POWER-O-MATIC 60 Control System has no electronic tubes or amplifiers . . . no photo cells . . . no timers or variacs . . . no relays or switches . . . no potentiometer slidewires . . . no auxiliary devices to wear, burn or replace

EFFICIENCY: Pin-point temperature control is achieved by placing saturable reactor in series with Blue M Eterna heating elements across electrical power line. Variable D.C. voltage proportional to temperature is fed to reactor from POWER-O-MATIC 60 Control System. Temperature changes are detected by a type 316 stainless steel thermal sensing bulb and mechanical changes are converted to electrical changes by POWER-O-MATIC 60.

SAVINGS: Proportioning power to unit reduces voltage impressed across heating element. Watt density is reduced and heating element life is extended because thermal shock with ordinary on-off cycling is completely eliminated

SAFETY-DIAL POINTER LOCK: Primary Protection with RANGE-LOCK . . . AT NO ADDED COST. Built-in, this exclusive power limiting feature mechanically locks the control armature to prevent an abnormal rise of set operating temperature irrespective of ruptured thermal system or inadvertent turning of control knob. Dial pointer lock, an added feature, secures temperature setting against accidental change. UNIT CAN BE OPERATED UNATTENDED

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY BLUE M

SEE PAGE 10

BLUE M

GENERAL SPECIFICATIONS AND PRICES

ETERNA ELEMENTS: Black-Heat; "Controlled" low-watt density, even at maximum temperature. Reducing voltage reduces watt density. No thermal shock, no screws or welded parts, continuous elements with external connections, remote from work chamber.

VOLTMETER: Power input indication.

CIRCUIT BREAKER: As short circuit protection.

INTERIOR: All models and inside of door(s) type 304, 18-8 polished stainless—excellent heat and corrosion resistance.

EXTERIOR: 2 STYLES AVAILABLE

A) All stainless steel, type 304, 18-8 or

B) Heavy gauge cold rolled steel. Attractive FORMICA white enamel. (All units reinforced with minimum through-bracing . . . all welded).

DOOR AND HARDWARE: Double wall. Exclusive adjustable no-slam, cam action latch and new chrome-plated hinges maintain air-tight seal. Silicone rubber seal. Door finished in light blue enamel for modern contrast.

INSULATION: Minimum 3½ in. thick blankets of non-hygroscopic, fireproof, Fiberglas wool; will not settle.

SHELVES (2): Wire rod, electro-polished stainless steel, adjustable.

READY-READ TEMPERATURE INDICATOR: 3½" diameter—for easier, more efficient operation. Filled system—no gears or hair springs. Stainless sensing bulb. Dual scale in degrees C. and F.

INTAKE PORTS AND VENTILATORS: Scientifically designed. Placement of intake ports facilitates natural air currents inside working chamber. Adjustable double ventilators at oven top allow exhaust of obnoxious fumes.

WIRING: Totally enclosed. Terminal box at rear of base on all models. Connect to power line. Meets N.E. Code, as amended.

ALL STAINLESS STEEL MODELS

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Total KVA	Voltage 60 Hz. A.C. Single Phase	Cubic Feet Capacity	Shipping Weight Lbs. (Kg.)	Complete Price With OTP
DL-1006A	14 (35)	14 (35)	14 (35)	22 (55)	25 (63)	35 (88)	1.1	120 V. 208 V. 240 V.	1.6	230 (104)	$920.00
DL-1006B											1025.00
DL-1006C											920.00
DL-1106A	20 (51)	15 (38)	20 (51)	28 (70)	26 (65)	41 (103)	2.0	120 V. 208 V. 240 V.	4.1	310 (141)	1160.00
DL-1106B											1260.00
DL-1106C											1160.00
DL-1206B	25 (63)	20 (51)	20 (51)	33 (84)	31 (78)	41 (103)	3.4	208 V. 240 V.	5.8	310 (141)	1455.00
DL-1206C											1390.00
*DL-1306B	37 (93)	20 (51)	25 (63)	45 (113)	31 (78)	46 (116)	4.6	208 V. 240 V.	10.0	500 (227)	2080.00
*DL-1306C											1975.00

ENAMELED STEEL EXTERIOR MODELS

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Total KVA	Voltage 60 Hz. A.C. Single Phase	Cubic Feet Capacity	Shipping Weight Lbs. (Kg.)	Complete Price With OTP
DL-1026A	14 (35)	14 (35)	14 (35)	22 (55)	25 (63)	35 (88)	1.1	120 V. 208 V. 240 V.	1.6	230 (104)	$795.00
DL-1026B											870.00
DL-1026C											795.00
DL-1126A	20 (51)	15 (38)	20 (51)	28 (70)	26 (65)	41 (103)	2.0	120 V. 208 V. 240 V.	4.1	310 (141)	995.00
DL-1126B											1085.00
DL-1126C											995.00
DL-1226B	25 (63)	20 (51)	20 (51)	33 (84)	31 (78)	41 (103)	3.4	208 V. 240 V.	5.8	310 (141)	1265.00
DL-1226C											1140.00
*DL-1326B	37 (93)	20 (51)	25 (63)	45 (113)	31 (78)	46 (116)	4.6	208 V 240 V.	10.0	500 (227)	1770.00
*DL-1326C											1685.00

*Has two doors but no center mullion

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories

EXTRA SHELVES: STAINLESS STEEL, as described above. Shelf positions indicated in ( ).

Oven I.D.: 14" x 14" (5); MO4-A103 ..... $25.00 Each
Oven I.D.: 20" x 15" (8); MO4-A102 ..... $34.00 Each
Oven I.D.: 25" x 20" (8); MO4-A101 ..... $48.00 Each
Oven I.D.: 37" x 20" (10); MO4-A113 ..... $79.00 Each

CABINET TYPE FLOOR STAND: Heavy steel construction with auxiliary shelf and door(s). Blue enamel to complement chamber. Designed to provide height of 40 inches from floor level to bottom of chamber

Series Number	Floor Stand Catalog Number	Price Each
DL-1006 DL-1026	FS-142	$100.00
DL-1106 DL-1126	FS-143	110.00
DL-1206 DL-1226	FS-144	115.00
DL-1306 DL-1326	FS-145	145.00

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly.

SEE ADDITIONAL ACCESSORIES AND SPARE PARTS ON PAGES 164-167

BLUE M

mechanical convection Horizontal Air-Flow ULTRA-TEMP® OVENS *with* POWER-O-MATIC 80® PATENTED

solid-state SCR proportioning control system, separate indication, built-in overtemperature protection and one-pass air-flow system

TEMPERATURE RANGE:
15°C. above ambient to +704°C. (+1300°F.)

RUN-UP: To +500°C. and +700°C. No load and with rated voltage is approximately 60 minutes and 90 minutes respectively. Complete 9-point thermocouple survey, cool-down times, recovery times and exhaust capacities available for every model.

UNIFORMITY: ±¾% of setpoint

CONTROL ACCURACY: ±0.5°C.

***COMBINED REPEATABILITY AND SETABILITY:** ±0.1% of scale.

***Repeatability:** tests control. Setting is fixed, door is opened to cool chamber. When door is closed, chamber heats up to control setting within value shown.

***Setability:** tests operational efficiency. When different operators set control at given temperature, temperature achieved is within value shown.

EXCLUSIVE BLUE M SOLID-STATE CONTROL

BUILT-IN MAX-SET OVERTEMPERATURE PROTECTION
Indicating type, activated by its own thermocouple.

10-TURN POTENTIOMETER
Insures fine setability to match capability of control

ELAPSED TIME METER

DIRECT DRIVE MOTOR/BLOWER SYSTEM
Designed for high temperature operation

BALANCED 3-PHASE ELECTRICAL SYSTEM

LOW NOISE LEVEL
At 3 feet from oven with door closed or open easily meets OSHA requirements

EASILY THE FINEST HIGH TEMPERATURE OVENS EVER BUILT BY BLUE M— NOW COMPLETELY REDESIGNED FOR NEW, MODERN APPEARANCE . . . BETTER-THAN-EVER PERFORMANCE

Already Blue M's finest high temperature ovens, these chambers have been completely redesigned to provide new and superior performance—new and improved appearance.

The newly designed control panel and control components, for example, are mounted on a sliding drawer. After simply loosening four special fasteners, the operator can pull the drawer forward for access to any part requiring inspection. A disconnect switch automatically shuts off power when the drawer is opened.

Safety is further stressed by an air-flow switch which *insures proper blower rotation and automatically shuts down the oven if normal air-flow through the chamber is stopped or drastically reduced.* A new balanced 3-phase electrical system complements the new direct drive motor/blower system by assuring maximum efficiency from both the power used and from all electrical components.

The cabinets, too, have been redesigned to include heavier insulation and air-shielded doors with especially rugged hardware. The all-stainless interiors require a minimum of fasteners. And the entire series features a new, modern blue enamel finish which complements any department

The unmatched performance of these chambers stems from Blue M's patented POWER-O-MATIC 80 Control. Completely automatic and stepless, it assures straight-line performance . . . enables these chambers to out-perform any other high temperature ovens in this catalog.

Unique design includes a 10-turn potentiometer working with Blue M's exclusive Memory Ring® Temperature Calibrating Dial to achieve the remarkable setability/repeatability shown. SCR's are fused to protect them against failure of any portion of the system. Ambient temperature compensation, line voltage compensation and overtemperature protection are built-in. One-pass air-flow permits operation from 15°C. above ambient—extremely low in chambers with this temperature range.

The indicating type overtemperature protection and control systems are separate from one another, and operate independently with individual thermocouples. The operator has an accurate representation of actual chamber conditions. He "sees" exactly what's going on inside the oven—regardless of control setting. The same is true of the OTP: it functions in response to chamber conditions only. It also features Blue M's unique MAX-SET™ time-delay circuitry described on page 14 which eliminates nuisance tripping. This design makes these ovens distinctive from any other on the market, and offers final assurance of their engineering and operational superiority. Similar units with lower temperature range and less sophisticated control are described on the following pages.

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY BLUE M SEE PAGE 16

BLUE M

SEE PAGES 12 AND 13 FOR FULL DESCRIPTION OF POWER-O-MATIC 80 CONTROL SYSTEM.

GENERAL SPECIFICATIONS AND PRICES

PATENTED BLUE M INSTRUMENTATION

POWER-O-MATIC 80 Solid-State SCR Proportioning Control System. Offers infinitely proportional, true straight-line performance throughout the unit's range. Designed specifically for control of elevated temperatures. Including a 10-turn potentiometer and working in conjunction with Blue M's patented Memory Ring® Temperature Calibrating Dial, POWER-O-MATIC 80 offers an expanded scale length of over 70" for remarkable setability/repeatability. Dual scale.

BUILT-IN OVERTEMPERATURE PROTECTION: Indicating type, dual scale with range to complement main control and installed adjacent to it. Indication accuracy ±1% of full scale. Provides constant monitoring over entire span; shows actual chamber temperature at all times. Operates independently of control in response to its own thermocouple. Features exclusive Blue M MAX-SET time-delay circuitry and operation described on page 14.

DUAL ELEMENT THERMOCOUPLE: One for control, one for OTP. Break protection: unit shuts down if T/C fails.

ADJUSTABLE ONE-PASS AIR-FLOW SYSTEM: Air passes over heaters and through chamber only once if necessary for low temperature operation, maximum fume exhaust.

HOUSING: All new. Double wall, all-welded heavy gauge oven steel, reinforced. Has extra heavy steel front door plate finished with high temperature aluminum. Balance of oven baked-on attractive blue enamel.

INTERIOR: Type 304, 18-8 corrosion-resistant stainless.

INSULATION: Special +1600°F. material—6" all sides and door.

DOOR: New air-shielded design with inner and outer 18-8 stainless bellows type, leak-proof seals. New, rugged heavy-duty hinges, pivot-lock latch.

ETERNA HEATER BANKS: Assure years of service. Cylindrical type supported by grooved ceramic refractories. Element compartment bottom has stainless panel to cover and protect interior from radiant heat.

SHELVES (2): Non-tip design. Wire rod type reinforced except largest model which are expanded stainless with heavy stainless angle framing. Shelf positions: 5580 (5); 6680 (8); 7780 (8); 8880 (5).

DIRECT DRIVE MOTOR/BLOWER: No bearings, pulleys or belts. Extra large, fan-cooled ball bearing motor drives multi-bladed blower directly.

AIR-FLOW SWITCH: Shuts down oven if chamber air-flow is stopped or drastically reduced.

MOTOR OVERLOAD PROTECTION: Built-in thermal overload protection starter insures complete safety.

NEON PILOT LAMP: Red, indicates unit operation.

FUSED CONTROL CIRCUIT: Protects against short circuits.

ENCLOSED WIRING COMPARTMENT: Inside cabinet, protects all wiring. Wiring meets amended N.E. Code.

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Total KVA	Voltage 60 Hz. A.C. 3 Phase	Cubic Feet Capacity	Shipping Weight Lbs. (Kg.)	Complete Price With OTP
POM-5580E-3	14 (35)	14 (35)	14 (35)	39 (93)	31 (78)	61 (154)	7.0	208 V	1.6	810 (367)	$3165.00
POM-5580F-3								240 V			3165.00
POM-6680E-3	20 (51)	18 (45)	20 (51)	45 (113)	35 (88)	67 (170)	10.0	208 V.	4.0	1200 (544)	3880.00
POM-6680F-3								240 V.			3880.00
POM-6680G-3								480 V.			3975.00
POM-7780E-3	25 (63)	20 (51)	20 (51)	50 (127)	37 (93)	67 (170)	13.0	208 V	5.8	1300 (590)	4295.00
POM-7780F-3								240 V			4295.00
POM-7780G-3								480 V			4650.00
POM-8880E-3	38 (96)	20 (51)	25 (63)	63 (159)	37 (93)	72 (183)	15.5	208 V	11.0	1500 (681)	6230.00
POM-8880F-3								240 V			6035.00
POM-8880G-3								480 V.			6455.00

Units for 50 Hz available, all models Please contact factory. Small Model also available for 480 V./3 Ph. Please contact factory for details

OPTIONAL AND RECOMMENDED ACCESSORIES — SPARE PARTS

Please give unit model no., and voltage when ordering accessories

Series Number	Extra Stainless Steel Shelves as Described Above: Part Number	Price Each	VYCOR® /PYREX Glass Observation Panels, designed especially for these ovens. Built into center of door. For delivery with unit only.	Lead-in Port and Cover, 3" Dia. For All Models	Program Timers Built-in For All Models
POM-5580	MO4-A121	$48.00	Viewing Area: 5¼" W. x 5½" H. Cat. No. GPA-106A Price Installed: $300.00	Center Top Wall Cat. No. POR-100	To shut off elements only 24-Hour Part No. C12A-1 $65.00
POM-6680	MO4-A127	76.00	TWO SIZES AVAILABLE Viewing Area: 8" W. x 8" H. Cat. No. GPA-107A Price Installed: $480.00	Center Right Wall Cat. No. POR-100A	
POM-7780	MO4-A130	92.00		Center Back Wall Cat. No. POR-100C	7-Day Part No. C12A-3 $85.00
POM-8880	MO4-B115	107.00	Viewing Area: 11" W. x 11" H. Cat. No. GPA-108A Price Installed: $570.00	$45.00 Installed	

BLUE M

ECONOMY
mechanical convection
Horizontal Air-Flow
ULTRA-TEMP® OVENS

with

solid-state indicating control potentiometer and built-in overtemperature protection

TEMPERATURE RANGE
15°C. above ambient to +538°C. (+1000°F.)

CONTROL AND UNIFORMITY: ±1½% of scale. Complete 9-point thermocouple survey, cool-down times, recovery times and exhaust capacities available for every model upon request.

SOLID-STATE CONTROL POTENTIOMETER
Indicating type, provides good control throughout extended range. Dual scale.

BUILT-IN OVERTEMPERATURE PROTECTION
Solid-state, complements main control for safety of workloads and equipment. Dual scale.

ONE-PASS AIR-FLOW SYSTEM

HEAVY STEEL HOUSINGS

STAINLESS STEEL INTERIORS

DIRECT DRIVE MOTOR/BLOWER SYSTEM
Designed for operation at elevated temperatures.

FULLY ENCLOSED WIRING COMPARTMENT
Protects against dirt and contamination

BALANCED 3-PHASE ELECTRICAL SYSTEM

LOW NOISE LEVEL
At 3 feet from oven with door closed or open easily meets OSHA requirements.

COMPLETELY RE-ENGINEERED! PROVIDES GOOD PERFORMANCE THROUGHOUT NEW, HIGHER TEMPERATURE RANGE

These completely redesigned chambers couple already proven and widely accepted engineering features with solid-state instrumentation carefully matched to the inherent capabilites of the units. The result is a series of ovens offering good performance throughout their higher-than-normal temperature range at a price well within most budgets.

Features include a newly designed control panel and control components mounted on a sliding drawer. After simply loosening four special fasteners, the operator can pull the drawer forward for access to any part requiring inspection. A disconnect switch automatically shuts off power when the drawer is opened.

Safety is further stressed by an air-flow switch which insures proper blower rotation and automatically shuts down the oven if normal air-flow through the chamber is stopped or drastically reduced. A new balanced 3-phase electrical system complements the new direct drive motor/blower system by assuring maximum efficiency from both the power used and from all electrical components.

The cabinets, too, have been redesigned to include heavier insulation and air-shielded doors with especially rugged hardware. The all-stainless interiors require a minimum of fasteners, facilitating servicing if ever necessary. And the entire series features a new, modern blue enamel finish which complements any department

Built-in overtemperature protection, also standard, consists of a solid-state instrument similar to the main control in both appearance and range to protect valuable workloads and equipment at all times. It includes Blue M's exclusive MAX-SET time delay circuitry described on page 14. These and the other construction features described on the next page all contribute towards making these ovens an outstanding value.

Similar units with a very high +704°C. (+1300°F.) range and equipped with Blue M's patented POWER-O-MATIC 80® Solid-State SCR Proportioning Control System—the finest high temperature ovens ever built by Blue M—are described on the preceding pages.

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM
WARRANTY BLUE M
SEE PAGE 16

BLUE M

GENERAL SPECIFICATIONS AND PRICES

SOLID-STATE INSTRUMENTATION

MAIN CONTROLLER: Solid-state indicating temperature control of potentiometric design featuring advanced integrated circuitry and time proportioning. Shock and vibration resistant. Illuminated direct read-out dial with 6" scale provides setting accuracy to within 0.5% of scale. Indication is 10% of span on either side of setpoint. Example: if temperature is set at +300°C. on a controller with a 600°C. span, indicator registers actual chamber temperature at any point between +240°C. and +360°C. Indication accuracy is ±1½% of full scale.

BUILT-IN OVERTEMPERATURE PROTECTION: Similar solid-state instrument complements main control and conveniently installed adjacent to it. Features exclusive Blue M MAX-SET™ time-delay circuitry and operation as described on page 14. Easily set. Positive protection at all times . . . standard on all units.

DUAL ELEMENT THERMOCOUPLE: One for control, one for OTP. Break protection: units shuts down if T/C fails.

ADJUSTABLE ONE-PASS AIR-FLOW SYSTEM: Air passes over heaters and through chamber only once if necessary for low temperature operation, maximum fume exhaust.

HOUSING: All new. Double wall, all-welded heavy gauge oven steel, reinforced. Has extra heavy steel front door plate finished with high temperature aluminum. Balance of oven baked-on attractive blue enamel.

INTERIOR: Type 304, 18-8 corrosion-resistant stainless.

INSULATION: Special +1600°F. material—6" all sides and door.

DOOR: New air-shielded design with inner and outer 18-8 stainless bellows type, leak-proof seals. New, rugged heavy-duty hinges, pivot-lock latch.

ETERNA HEATER BANKS: Assure years of service. Cylindrical type supported by grooved ceramic refractories. Element compartment bottom has stainless panel to cover and protect interior from radiant heat.

SHELVES (2): Non-tip design. Wire rod type reinforced except largest model which are expanded stainless with heavy stainless angle framing. Shelf positions: CW-150 (5); CW-160 (8); CW-170 (8); CW-180 (5).

DIRECT DRIVE MOTOR/BLOWER: No bearings, pulleys or belts. Extra large, fan-cooled ball bearing motor drives multi-bladed blower directly.

AIR-FLOW SWITCH: Shuts down oven if chamber air-flow is stopped or drastically reduced.

MOTOR OVERLOAD PROTECTION: Built-in thermal overload protection starter insures complete safety.

NEON PILOT LAMP: Red, indicates unit operation.

FUSED CONTROL CIRCUIT: Protects against short circuits.

ENCLOSED WIRING COMPARTMENT: Inside cabinet, protects all wiring. Wiring meets amended N.E. Code.

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Total KVA	Voltage 60 Hz. A.C. 3 Phase	Cubic Feet Capacity	Shipping Weight Lbs. (Kg.)	Complete Price With OTP
CW-150E-4	14 (35)	14 (35)	14 (35)	39 (93)	31 (78)	61 (154)	7.0	208 V.	1 6	810 (367)	$2320.00
CW-150F-4								240 V.			2195.00
CW-160E-4	20 (51)	18 (45)	20 (51)	45 (113)	35 (88)	67 (170)	10.0	208 V.	4.0	1200 (544)	2790.00
CW-160F-4								240 V			2740.00
CW-160G-4								480 V			2740.00
CW-170E-4	25 (63)	20 (51)	20 (51)	50 (127)	37 (93)	67 (170)	13.0	208 V	5.8	1300 (590)	3595.00
CW-170F-4								240 V.			3490.00
CW-170G-4								480 V			3490.00
CW-180E-4	38 (96)	20 (51)	25 (63)	63 (159)	37 (93)	72 (183)	15.5	208 V	11.0	1500 (681)	4430.00
CW-180F-4								240 V			4285.00
CW-180G-4								480 V.			4285.00

Units for 50 Hz available, all models Please contact factory Small Model also available for 480 V /3 Ph Please contact factory for details

OPTIONAL AND RECOMMENDED ACCESSORIES — SPARE PARTS

Please give unit model no , and voltage when ordering accessories

Series Number	Extra Shelves as Described Above: Part Number	Price Each	VYCOR® /PYREX Glass Observation Panels, designed especially for these ovens. Built into center of door. For delivery with unit only.	Lead-in Port and Cover, 3" Dia. For All Models	Program Timers Built-in For All Models
CW-150	MO4-A121	$48.00	Viewing Area: 5¼" W. x 5½" H. Cat. No. GPA-106A Price Installed: $300.00	Center Top Wall Cat. No. POR-100	To shut off elements only 24-Hour Part No. C12A-1 $65.00 7-Day Part No. C12A-3 $85.00
CW-160	MO4-A127	76.00	TWO SIZES AVAILABLE Viewing Area: 8" W. x 8" H. Cat. No. GPA-107A Price Installed: $480.00	Center Right Wall Cat. No. POR-100A	
CW-170	MO4-A130	92.00		Center Back Wall Cat. No. POR-100C	
CW-180	MO4-B115	107.00	Viewing Area: 11" W. x 11" H. Cat. No. GPA-108A Price Installed. $570.00	$45.00 Installed	

Shipping weights shown are for standard models Units ordered with accessories may require special packing, increasing shipping weight slightly

SEE ADDITIONAL ACCESSORIES AND SPARE PARTS ON PAGES 164-167

BLUE M

Horizontal Air-Flow

mechanical convection

Bench Type

ULTRA-TEMP® OVENS

with

POWER-O-MATIC 80® PATENTED

solid-state SCR proportioning control system, separate indication and built-in overtemperature protection

TEMPERATURE RANGE
+66° C. to +649° C. (+1200° F.)

EXCLUSIVE BLUE M SOLID-STATE CONTROL
Designed specifically for precise regulation of elevated temperatures

BUILT-IN MAX-SET OVERTEMPERATURE PROTECTION
Indicating type, activated by its own thermocouple. Exclusive Blue M time-delay feature eliminates nuisance tripping.

10-TURN POTENTIOMETER
Insures fine setability to match capability of control

HEAVY-DUTY CONSTRUCTION
Long wearing—heavily insulated

QUALITY MOTOR/BLOWER SYSTEM
Designed for high temperature operation without the need for pulleys or bearings.

ELAPSED TIME METER
Shows number of hours unit has actually operated

RADICALLY IMPROVED! ULTRA-HIGH TEMPERATURES NOW UNDER SOLID-STATE FULLY PROPORTIONAL CONTROL

The use of Blue M's patented POWER-O-MATIC 80 Solid State Proportioning Control System with these proven ovens has converted them into the finest high temperature bench type chambers you can buy. Completely automatic and stepless with no moving parts, no contacts, the control provides true straight-line, infinitely proportional performance throughout their unusually broad temperature range

POWER-O-MATIC 80 is also simple in design and in operation Even inexperienced personnel can quickly and surely place the chamber in service—and keep it operating—with a minimum of supervision. Calibration and desired operating parameters are also maintained for extended periods without adjustment

The precise temperature regulating capability of the control is complemented by a 10-turn potentiometer working in conjunction with Blue M's patented Memory Ring® Temperature Calibrating Dial to provide a remarkable setability of 0.25% of span. SCR's are fully fused to protect them against failure of any portion of the system. Ambient temperature compensation, line voltage compensation and overtemperature protection are built-in. New direct drive motor/blower system assures more efficient operation

The indicating type overtemperature protection system and control system are separate and distinct from one another, and operate independently with individual thermocouples The operator is provided with a true and accurate representation of actual chamber conditions. He "sees" exactly what's going on inside the oven—regardless of control setting. The same is true of the OTP: it functions in direct response to chamber conditions only. It also features Blue M's unique MAX-SET™ time-delay circuitry described on page 14 which eliminates nuisance tripping.

Safety is further stressed by an air-flow switch which insures proper blower rotation and automatically shuts down the oven if normal air-flow through the chamber is stopped or drastically reduced.

While a new system, the POWER-O-MATIC 80 Control has undergone prolonged and extensive operational and field testing. This unquestionably indicates that it easily surpasses the performance of more costly commercial solid-state instrumentation. It assures complete satisfaction for all such critical high temperature applications as cable wire testing, insulation tests, heat-treating metals and alloys, and glass annealing in these quality chambers.

Similar units with a less sophisticated control system and a somewhat lower temperature range are described on the following pages.

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY BLUE M

SEE PAGE 16

BLUE M

SEE PAGES 12 AND 13 FOR FULL DESCRIPTION OF POWER-O-MATIC 80 CONTROL SYSTEM.

GENERAL SPECIFICATIONS AND PRICES

PATENTED BLUE M INSTRUMENTATION

POWER-O-MATIC 80 SOLID-STATE SCR PROPORTIONING CONTROL SYSTEM. Patented Blue M Control (described on pages 12 and 13) offers infinitely proportional, true straight-line performance throughout the unit's range. Designed specifically for control of elevated temperatures. Including a 10-turn potentiometer and working in conjunction with Blue M's patented Memory Ring® Temperature Calibrating Dial, POWER-O-MATIC 80 offers an expanded scale length of over 70" for a remarkable setability of 0.25% of span. Dual scale in °C. and °F.

BUILT-IN OVERTEMPERATURE PROTECTION: Indicating type, dual scale with range to complement main control and installed conveniently adjacent to it. Indication accuracy ±1% of full scale. Provides constant monitoring over entire span; you see what the chamber temperature actually is at all times. Operates independently of control in response to its own thermocouple. Features exclusive Blue M MAX-SET time-delay circuitry and operation as described on page 14.

DUAL ELEMENT THERMOCOUPLE: One for control, one for OTP. Break protection: unit shuts down if T/C fails.

CONSTRUCTION: Triple wall housing and double wall door of heavy, cold rolled steel with a blue baked on enamel finish. Oven interior and interior of door is heavy gauge 18-8 stainless for long wearing utility plus maximum resistance to corrosion. Structural angles and V-shaped reinforcement pieces, strengthen interior and exterior. Extra heavy steel front plate finished in high temperature aluminum.

INSULATION: 5½ inches triple Mono-Block, Fiberfrax and Fiberglas for minimum heat loss; fireproof and highly efficient. Walls and doors designed to keep heat loss to a practical minimum.

DOOR: Fully insulated; 5 inches triple Mono-Block, Fiberfrax and Fiberglas for minimum heat loss; fireproof and highly efficient. Doors hung with heavy-duty industrial type latch and hinges. Stainless steel bellows seal is exclusive and will last lifetime of oven.

DIRECT DRIVE MOTOR/BLOWER: No bearings, pulleys or belts. Quality air-cooled motor drives alloy blower directly.

AIR-FLOW SWITCH: Shuts down oven if chamber air-flow is stopped or drastically reduced.

EXHAUST: Positive, controllable escapement of fumes. Exhaust cover of Marinite with stainless covering.

ETERNA HEATER BANKS: Located at top of oven. Open, low gradient, famous Blue M Eterna elements assure years of service. Cylindrical type, supported by ceramic core and grooved, ceramic refractories. Insulated alloy panel covers elements, shielding workload from radiant heat.

NEON PILOT LAMP AND SWITCH: Pilot lamp plus extra capacity "on" and "off" switch are standard equipment. Red light denotes unit is in operation.

MOTOR OVERLOAD PROTECTION: Built-in thermal overload protection starter insures complete safety.

SHELVES (2): Stainless steel shelves, removable and adjustable in steps of 2½ in. Designed especially for elevated temperature use.

WIRING: All wiring complete and ovens are ready for connection to power supply. Wiring meets N.E. Code, as amended.

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Total KVA	Voltage 60 Hz. A.C. 3 Phase	Cubic Feet Capacity	Shipping Weight Lbs. (Kg.)	Complete Price With OTP
CFD-10E-4	16 (40)	14 (35)	16½ (41)	45 (113)	35 (88)	51 (128)	5.1	208 V. 240 V. 480 V.	2.1	735 (333)	$2775.00 2685.00 2990.00
CFD-10F-4											
CFD-10G-4											
CFD-20E-4	24 (61)	20 (51)	20 (52)	55 (139)	37 (93)	53 (133)	9.6	208 V 240 V. 480 V	5.8	930 (422)	3625.00 3505.00 3910.00
CFD-20F-4											
CFD-20G-4											

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories

Series Number	Extra Shelves as Described Above Part Number	Price Each	Cabinet Type Floor Stand 33" High Auxiliary Shelf Blue Enamel Finish Catalog Number	Price Each	Extra I/C Thermocouple Only For All Models	Lead-in Port and Cover, 3" Dia. For All Models	Program Timers Built-in For All Models Please Specify
CFD-10	MO4-B102	$37.00	FS-190	$155.00	Part No C11B-1-1 $19.00	Center of back wall. Cat. No. POR-100C Center of left wall. Cat. No. POR-100B $45.00 PORTS ARE NOT AVAILABLE THROUGH TOP WALL	To shut off elements only. Part No. C12A-1 24 Hour $65.00 Part No. C12A-3 7 Day $85.00
CFD-20	MO4-B108	$54.00	FS-190	$155.00			

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly

BLUE M

Horizontal Air-Flow

mechanical convection
Bench Type
ULTRA-TEMP®OVENS
with

solid-state indicating control potentiometer and built-in overtemperature protection

TEMPERATURE RANGE
+66°C. to +538°C. (+1000°F.)

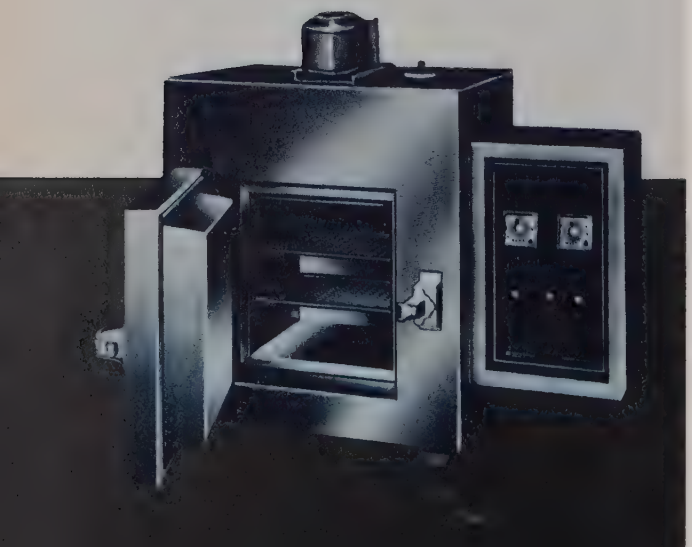
SOLID-STATE CONTROL POTENTIOMETER
Indicating type, provides good control throughout extended range. Dual scale.

BUILT-IN MAX-SET OVERTEMPERATURE PROTECTION
Solid-state, complements main control for safety of workloads and equipment

HEAVY-DUTY CONSTRUCTION
Long-wearing—heavily insulated. Heavy stainless steel interiors. Triple wall construction.

QUALITY MOTOR/BLOWER SYSTEM
Designed especially for high temperature operation without the need for pulleys or bearings.

WIRING COMPLETE
Ready for power hook-up



NOW . . . SOLID-STATE INSTRUMENTATION MAKES A GOOD OVEN EVEN BETTER

GOOD PERFORMANCE . . .
WIDE TEMPERATURE RANGE . . .
BUILT-IN SAFETY

Blue M has taken this popular series of bench type ovens and replaced the old-fashioned on-off control they formerly had with a new, modern solid-state control. Complementing it in both appearance and operation is a standard over-temperature protection instrument to serve as a valuable safeguard for equipment and workloads. New direct drive motor/blower system assures more efficient operation. The result is an already good mechanical convection, horizontal airflow chamber made even better through advanced electronic technology.

These units are ideal for such non-critical elevated temperature service as carbon steel tempering, glass annealing, and tempering high speed steels and non-ferrous parts as well as work involving silicone, Teflon, paints and varnish.

Similar units equipped with the patented POWER-O-MATIC 80® Solid-State Proportioning Control for more exacting applications requiring the ultimate in high-temperature control performance are described on the preceding pages.

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY BLUE M

SEE PAGE 16

BLUE M

GENERAL SPECIFICATIONS AND PRICES

IMPROVED INSTRUMENTATION

MAIN CONTROLLER: Solid-state indicating temperature control of potentiometric design featuring advanced integrated circuitry and time proportioning. Shock and vibration resistant. Illuminated direct read-out dial with 6" scale provides setting accuracy to within 0.5% of scale. Indication is 10% of span on either side of setpoint. Example: if temperature is set at +300°C. on a controller with a 600°C. span, indicator registers actual chamber temperature at any point between +240°C. and +360°C. Indication accuracy is ±1½% of full scale. Dual scale in °C. and °F.

BUILT-IN OVERTEMPERATURE PROTECTION: Similar solid-state instrument complements main control and conveniently installed adjacent to it. Features exclusive Blue M MAX-SET™ time-delay circuitry and operation as described on page 14. Easily set. Positive protection at all times . . . standard on all units.

CONSTRUCTION: Triple wall housing and double wall door of heavy, cold-rolled steel with blue baked on enamel finish. Interior of oven and door is heavy gauge 18-8 stainless for long wearing utility plus maximum resistance to corrosion. Structural angles and V-shaped reinforcement pieces, strengthen interior and exterior. Extra heavy steel front plate finished in high temperature aluminum.

INSULATION: 5½ in. triple Mono-Block, Fiberfrax and Fiberglas for minimum heat loss; fireproof, efficient. Walls and doors keep heat loss to a practical minimum.

DOOR: Fully insulated; 5 in. triple Mono-Block, Fiberfrax and Fiberglas for minimum heat loss; fireproof and highly efficient. Doors hung with heavy duty industrial type latch and hinges. Stainless steel bellows seal is exclusive and will last lifetime of oven.

DIRECT DRIVE MOTOR/BLOWER: No bearings, pulleys or belts. Quality air-cooled motor drives alloy blower directly.

AIR-FLOW SWITCH: Shuts down oven if chamber air-flow is stopped or drastically reduced.

ETERNA HEATER BANKS: Located at top of oven. Open, low gradient, famous Eterna elements assure years of service. Cylindrical type, supported by ceramic core and grooved, ceramic refractories. Insulated alloy panel covers elements, shielding workload from radiant heat.

VENT: Single exhaust port at top, with Marinite cover.

MOTOR OVERLOAD PROTECTION: Built-in thermal overload protection starter insures complete safety.

SHELVES (2): Stainless shelves furnished with each unit. Removable and adjustable in steps of 2½ in. Designed for elevated temperature use.

WIRING: All wiring complete. Ovens ready for connection to power. Wiring meets N.E. Code, as amended.

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Total KVA	Voltage 60 Hz. A.C. 3 Phase	Cubic Feet Capacity	Shipping Weight Lbs. (Kg.)	Complete Price With OTP
BFD-10E-3	16 (40)	14 (35)	16 (40)	48 (120)	31 (78)	50 (127)	5.1	208 V.	2.1	735 (333)	$2275.00
BFD-10F-3								240 V.			2150.00
BFD-10G-3								480 V.			2525.00
BFD-20E-3	24 (61)	20 (51)	20 (51)	56 (142)	37 (93)	54 (136)	9.6	208 V.	5.8	930 (422)	2885.00
BFD-20F-3								240 V.			2815.00
BFD-20G-3								480 V.			3060.00

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories.

Series Number	Extra Shelves as Described Above Part Number	Price Each	Cabinet Type Floor Stand 33" High; Auxiliary Shelf Blue Enamel Finish Catalog Number	Price Each	Lead-in Port and Cover, 3" Dia. For All Models	Program Timers Built-In For All Models Please Specify
BFD-10	MO4-B102	$37.00	FS-190	$155.00	Center of back wall. Cat. No. POR-100C Center of left wall. Cat. No. POR-100B $45.00	To shut off elements only. Part No. C12A-1 24 Hour $65.00
BFD-20	MO4-B108	$54.00	FS-190	$155.00	PORTS ARE NOT AVAILABLE THROUGH TOP WALL.	Part No. C12A-3 7 Day $85.00

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly.

BLUE M

Economy Series

New Elevated Temperature Range

gravity convection

Bench Type
ULTRA-TEMP® OVENS
with

solid-state indicating control potentiometer and built-in overtemperature protection

TEMPERATURE RANGE
+66°C. to +704°C. (+1300°F.)

SOLID-STATE CONTROL POTENTIOMETER
Indicating type, provides good control throughtout extended range

BUILT-IN MAX-SET OVERTEMPERATURE PROTECTION
Solid-state, complements main control for safety of workloads and equipment

ADJUSTABLE NO-SLAM, CAM ACTION LATCH AND HINGES

HEAVY-DUTY CONSTRUCTION
Long wearing—heavily insulated

MODELLA ELEMENTS
Dual banked—Low watt density

WIRING COMPLETE
Ready for instant use

NOW . . . SOLID-STATE CONTROL AND GREATLY EXTENDED TEMPERATURE RANGE IMPROVES AN ALREADY GOOD OVEN

GOOD PERFORMANCE . . .
WIDER TEMPERATURE RANGE . . .
BUILT-IN SAFETY

New, versatile temperature range regulated by a new, modern solid-state control in place of the old-fashioned on-off control they formerly had has made this popular series of bench type gravity convection ovens better than ever before. In addition, over-temperature protection instrument which complements the control in both appearance and operation has been included as standard to serve as a valuable safeguard for equipment and workloads.

These ovens are well suited for such non-critical laboratory and production work as glass annealing, tempering and drawing carbon steels as well as procedures involving titanium, Teflon, high speed steels and plastics.

For more exacting applications requiring the ultimate in high-temperature control performance and fine uniformity, we recommend the various mechanical convection ovens described on earlier pages.

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY BLUE M

SEE PAGE 16

BLUE M

GENERAL SPECIFICATIONS AND PRICES

IMPROVED INSTRUMENTATION

MAIN CONTROLLER: Solid-state indicating temperature control of potentiometric design featuring advanced integrated circuitry and time proportioning. Shock and vibration resistant. Illuminated direct read-out dial with 6" scale provides setting accuracy to within 0.5% of scale. Indication is 10% of span on either side of setpoint. Example: if temperature is set at +300°C. on a controller with a 600°C. span, indicator registers actual chamber temperature at any point between +240°C. and +360°C. Indication accuracy is ±1½% of full scale. Dual scale in °C. and °F.

BUILT-IN OVERTEMPERATURE PROTECTION: Similar solid-state instrument complements main control and conveniently installed adjacent to it. Features exclusive Blue M MAX-SET™ time-delay circuitry and operation as described on page 14. Easily set. Positive protection at all times . . . standard on all units.

CONSTRUCTION: Double wall housing and door of heavy, cold-rolled steel with blue baked on enamel finish. Interior of oven and door is heavy gauge 18-8 stainless, for long wearing utility plus corrosion resistance. Structural angles and V-shaped reinforcement pieces, strengthen interior and exterior. Extra heavy steel front plate finished in high temperature aluminum.

INSULATION: All six sides of dual insulation: 7 in. Fiberfrax and Fiberglas. Walls and door keep heat losses to a minimum.

DOOR AND HARDWARE: Door insulated same as unit. Lifetime stainless bellows seal. Exclusive adjustable no-slam, cam action latch and heavy-duty hinges maintain positive seal.

MODELLA HEATING ELEMENT: Improved method of spreading element over entire width and depth of bottom compartment insures temperature uniformity. Modella resistance wire is helically coiled and supported by grooved refractories on stainless supports. Refractories have high dielectric strength. Will not warp, are impervious to moisture and common acids, can withstand +2600°F.

VENTS AND INTAKE PORTS: Intake ports at bottom allow fresh air to enter and to be diffused through a wire mesh diffuser plate. Double exhaust ports at top, with stainless slides, control exhaust fumes.

SHELVES (2): Stainless expanded shelves with each unit except Series ABHH12 which has welded rod type. Removable and adjustable in steps of 2½ in. on Series ABHH-12 and 2 in. on Series ABHH-16; 3 in. on all other models. Heavy-duty. Designed for elevated temperature use.

WIRING: Wiring complete and ovens are ready for power hookup. Wiring meets N.E. Code, as amended.

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Total KVA	Voltage 50/60 Hz. A.C.	Cubic Feet Capacity	Shipping Weight Lbs. (Kg.)	Complete Price With OTP
ABHH12B-2	12 (31)	12 (31)	12 (31)	42 (105)	31 (78)	36 (90)	3.0	208 V./1 Ph.	1.0	475 (215)	$1425.00
ABHH12C-2								*240 V./1 Ph.			1295.00
ABHH16B-2	16 (40)	14 (35)	16 (40)	46 (116)	33 (84)	40 (101)	4.5	208 V./1 Ph.	2.1	575 (261)	1650.00
ABHH16C-2								*240 V./1 Ph.			1525.00
ABHH19E-2	19 (48)	18 (45)	16 (40)	49 (123)	37 (93)	40 (101)	6.8	208 V./3 Ph.	3.0	700 (318)	1785.00
ABHH19F-2								240 V./3 Ph.			1670.00
ABHH19G-2								480 V./3 Ph.			1975.00
ABHH24E-2	24 (61)	20 (51)	20 (51)	54 (136)	39 (98)	44 (110)	8.5	208 V./3 Ph.	5.8	850 (386)	1940.00
ABHH24F-2								240 V./3 Ph.			1790.00
ABHH24G-2								480 V./3 Ph.			2185.00

*For 480 V./1 Ph. operation, we supply a separate quality double wound transformer. Specify Cat. No. E17B-1-3 . . . . . $320.00

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories

Series Number	Extra Shelves as Described Above Part Number	Price Each	Cabinet Type Floor Stand 24" High Auxiliary Shelf Blue Enamel Finish Catalog Number	Price Each	Lead-in Port and Cover, 3" Dia. For All Models	Program Timers Built-in Please Specify For All Models
ABHH12	MO4-A108	$15.00	FS-129	$110.00	Provides Entry to Heat Chamber for Electrical Connections and Etc. Cat. No. POR-100 Located in Center of Back Wall $45.00	To Shut off Oven. 24 Hour Part No. C12A-1 $65.00 7 Day Part No. C12A-3 $85.00
ABHH16	MO4-B102	37.00	FS-130	125.00		
ABHH19	MO4-B103	48.00	FS-131	130.00		
ABHH24	MO4-B108	54.00	FS-132	150.00		

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly.

TYPICAL BENCH MODEL
Shown with optional
matching floor stand

TYPICAL FLOOR MODEL

BLUE M

MASTER/HEAT™

Horizontal Air-Flow MECHANICAL CONVECTION OVENS *with*

POWER-O-MATIC 50® PATENTED

solid-state high power proportioning control system and built-in overtemperature protection

CHOICE OF POPULAR SIZES

1.6, 4.1, 5.8, 10.0 and 24.0 cu. ft.

9 DISTINCT MODELS

Bench and Floor Types .

BUILT-IN OVERTEMPERATURE PROTECTION

ONE-PASS AIR-FLOW SYSTEM

ELAPSED TIME METER

MEMORY RING® TEMPERATURE

CALIBRATING DIAL

EQUIPMENT COVERED BY OUR EXCLUSIVE
PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY

SEE PAGE 16

BLUE M

TEMPERATURE RANGE
15°C. above ambient to +343°C. (+650°F.)

RUN UP TIME
To +300°C.: Approx. 40 minutes

REPEATABILITY
±0.25°C.

SETABILITY
±0.5°C.

RECOVERY TIME
(Door open 1 minute)
At +100°C.: 3 minutes
At +200°C.: 6 minutes
At +300°C.: 13 minutes

COOL DOWN
From +343°C. to +50°C.: Approx. 40 minutes
(With one-pass air-flow operating)

MAXIMUM EXHAUST
(Floor Models)
At +100°C.: 100 CFM
At +200°C.: 60 CFM
At +300°C.: 30 CFM

(Bench Models)
At +100°C.: 80 CFM
At +200°C.: 35 CFM
At +300°C.: 20 CFM

NOISE LEVEL
Easily meets OSHA requirements

ALL-NEW MASTER-HEAT CHAMBERS OFFER EXCELLENT PERFORMANCE, VERSATILE TEMPERATURE RANGE, AND SMART APPEARANCE AT A PRICE TO PLEASE EVEN THE MOST BUDGET-CONSCIOUS

The development of these MASTER-HEAT Ovens must be regarded as another significant forward stride in chamber design by Blue M in recent years. Beginning with their smart, modern appearance, carrying through with their many superb engineering features and ending with their excellent performance, these chambers will undoubtedly set the trend for oven manufacture for the foreseeable future.

The easy-to-use control panel, for example, and control components are mounted on a sliding drawer. This can be pulled forward for access to any part requiring inspection as this photo of a typical chamber indicates. Power is automatically shut off by a disconnect switch when the drawer is opened.

The floor models feature a balanced 3-phase electrical system which assures maximum efficiency from both the power used and from all electrical components. These chambers include a panel-mounted phase selector switch. When it is turned to the phase selected, the voltage applied to each independent heating element is indicated.

All 3-phase models feature an air-flow switch which insures proper blower rotation and automatically shuts down the oven if normal air-flow through the chamber is stopped or drastically reduced.

The fine performance characteristics of these chambers are the result of proven engineering concepts coupled with the capabilities of the POWER-O-MATIC 70 Control as detailed on page 12. This excellent instrumentation makes these chambers suitable for both production and testing applications as well as such more utilitarian work as drying, aging, baking and conditioning. Built-in overtemperature protection with Blue M's exclusive MAX-SET™ circuitry described on page 14 provides the workload and equipment safety you would expect in quality chambers

These and the many other advanced features found only in these MASTER-HEAT Ovens are described on the next page All are tastefully combined in newly designed cabinetry with a modern light blue enamel finish which complements any facility.

GENERAL SPECIFICATIONS

INTERIOR: Type 304, 18-8 stainless, including inner face of door(s) and cabinet opening perimeter.

EXTERIOR: All-welded heavy gauge cold-rolled steel, reinforced. Baked-on attractive blue enamel. Note: Exterior and interior chambers employ specially designed barriers to minimize heat conduction between joining faces.

ELAPSED TIME METER: Shows number of hours oven has actually operated. (See page 15.)

MAX-SET OVERTEMPERATURE PROTECTION: Safeguards workloads and equipment. (See page 14.)

ADJUSTABLE ONE-PASS AIR-FLOW SYSTEM: Air passes over heaters and through chamber only once if necessary. Permits almost 100% exhaust of fumes. If 100% exhaust needed, higher K.W. rating may be required to obtain maximum temperature. Exhaust is damper-controlled.

DOOR(S) AND HARDWARE: Double wall. Exclusive adjustable no-slam, cam action latch and chrome-plated hinges. Double silicone rubber seals plus stainless steel spring heat barriers around entire door perimeter. All models with working chambers larger than 25" wide I.D. have two doors but no center mullion. Others have one door.

BENCH MODELS
TEMPERATURE RANGE: TO +343°C. (+650°F.)

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Total KVA	Voltage 60 Hz. A.C. 1 Phase	Cubic Feet Capacity	Shipping Weight Lbs. (Kg.)	Complete Price With OTP	*Optional Cabinet Type Floor Stand (Cat. No.)
POM7-146C	14 (35)	14 (35)	14 (35)	29 (73)	26 (65)	43 (109)	3.8	**240 V.	1.6	250 (113)	$1045.00	(FS-191) $95.00
POM7-206C	20 (51)	18 (45)	20 (51)	35 (88)	30 (76)	49 (123)	4.6	**240 V.	4.1	350 (159)	1160.00	(FS-192) 110.00
POM7-256C	25 (63)	20 (51)	20 (51)	40 (101)	32 (80)	49 (123)	6 7	**240 V	5 8	475 (215)	1315.00	(FS-193) 125.00

*Addition of floor stand raises unit approx. 21"
**These models will operate reliably when connected to 208 volt service. A 25% reduction in element power will result

FLOOR MODELS
TEMPERATURE RANGE: TO +343°C. (+650°F.)

*Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Total KVA	Voltage 60 Hz. A.C. 3 Phase	Cubic Feet Capacity	Shipping Weight Lbs. (Kg.)	Complete Price With OTP
POM7-136F POM7-136G	38 (95)	20 (51)	25 (63)	53 (133)	32 (80)	62 (157)	9.9	** 240 V 480 V.	10 0	780 (354)	$2585.00
POM7-336F POM7-336G	25 (63)	20 (51)	38 (95)	40 (101)	32 (80)	75 (190)	9.9	** 240 V. 480 V	10 0	800 (363)	2585.00
POM7-1406F POM7-1406G	48 (120)	24 (61)	36 (90)	63 (159)	36 (90)	73 (185)	13.2	**240V. 480 V.	24 0	950 (431)	3265.00

*All models have two doors but no center mullion, except Models POM7-336F & G which have one door
**These models will operate reliably when connected to 208 volt service. A 25% reduction in element power will result
NOTE: All 3 phase units have an air-flow switch. See description above

BLUE M

AND PRICES

THERMOCOUPLE LEAD-IN PORT: Conveniently located in back wall. Facilitates chamber calibration in conjunction with external instrumentation.

INSULATION: Fiberglas, minimum 4" thick, non-hygroscopic, fireproof.

ETERNA HEATER BANKS: Black-Heat; "Controlled" low watt density. Shielded. No radiant heat. Assure years of service.

AIR CIRCULATION: Quality ball bearing motor and balanced multi-bladed blower designed especially for long service at elevated temperatures. Circulate heated air horizontally across working chamber for uniform heat distribution.

AIR-FLOW SWITCH: (3 phase units only.) Shuts down oven if chamber air-flow is stopped or drastically reduced.

SHELVES: Two, nickel-plated wire or expanded steel, depending on model. Comparable electropolished stainless shelves optional. Stainless non-tilting type brackets for shelf adjustment on 2" centers.

READY-READ TEMPERATURE INDICATOR: 3½" diameter—for easier, more efficient operation. Dual scale in degrees C. and F.

VOLTMETER: Indicates voltage on heating element.

NEON PILOT LAMPS: Red; denotes unit operation, amber shows overtemperature condition.

WIRING: Complete, totally enclosed. Terminal box. Meets amended N.E. Code and NEMA standard.

OPTIONAL AND RECOMMENDED ACCESSORIES — SPARE PARTS

Please give unit model no., and voltage when ordering accessories

Series Number	*Recording and Indicating Thermometers (Choice of 2 Available for Each Oven)				Lead-in Port and Cover	Built-in Automatic Program Timers. To Shut Off Oven
	Part Number	Temperature Range	Chart Rotation	**Extra Charts 100/Box		
AVAILABLE FOR ALL MODELS AS INDICATED	CO2A-2-5 CO2A-2-6	+40°C. to +340°C. +40°C. to +340°C.	1 Day 7 Day	C10A-2-11 C10A-2-12	3" dia., centered in back wall. All models. Cat. No. POR-100C $45.00 Installed	Part No. C12A-1, 24 Hr. $65.00 Installed Part No. C12A-3, 7 Day $85.00 Installed

*Installed Price $385.00 all ranges
**Additional charts $9.00/Box

Instrument bracket-mounted on right side near top Adds approx 17" to overall width of unit.

NOTE
When this instrument is ordered, standard temperature indicator is not supplied

DOUBLE GLASS OBSERVATION PANELS. CLEAR TEMPERED GLASS—BUILT INTO CENTER OF DOOR(S)

For delivery with unit only.

Series Number	Catalog Number	Viewing Area (Inches)	Price Installed	Series Number	Catalog Number	Viewing Area (Inches)	Price Inst. Per Door
POM7-146	GPA-100	6" W. x 8 H	$75.00	POM7-136†	GPA-102	11" W x 16" H	$110.00
POM7-206 POM7-256	GPA-101 GPA-101X	9¼ W. x 12¾ H 12¾ W. x 9¼ H.	$95.00	POM7-336 & 1406†	GPA-103	13 W. x 19½ H.	115.00

†Units with 2 doors Specify if 2 viewing areas are desired

EXTRA SHELVES As described above, with 2 stainless brackets.

(Nickel-plated Steel)

Oven I.D.: 14" x 14": Part No. MO4-A215..... $24.00 Each
Oven I.D.: 20" x 18": Part No. MO4-A216..... 27.00 Each
Oven I.D.: 25" x 20": Part No. MO4-A217..... 28.00 Each
Oven I.D.: 38" x 20": Part No. MO4-B202..... 48.00 Each
Oven I.D.: 48" x 24": Part No. MO4-B203..... 62.00 Each

(Stainless Steel)

Oven I.D.: 14" x 14": Part No. MO4-A115..... $42.00 Each
Oven I.D.: 20" x 18": Part No. MO4-A116..... 47.00 Each
Oven I.D.: 25" x 20": Part No. MO4-A117..... 56.00 Each
Oven I.D.: 38" x 20": Part No. MO4-B116..... 78.00 Each
Oven I.D.: 48" x 24": Part No. MO4-B124..... 98.00 Each

Shipping weights, shown are for standard models Units ordered with accessories may require special packing, increasing shipping weight slightly

SEE ADDITIONAL ACCESSORIES AND SPARE PARTS ON PAGES 164-167.

BLUE M

STABIL-THERM®

mechanical convection

Horizontal Air-Flow ELECTRIC UTILITY OVENS

with

POWER-O-MATIC 70® PATENTED

solid-state proportioning control system and built-in overtemperature protection

TEMPERATURE RANGE:
+38°C. to +260°C. (+500°F.)

TEMPERATURE CONTROL TOLERANCE: ±0.2°C.

BUILT-IN AMBIENT TEMPERATURE COMPENSATION
Chamber temperature remains constant (±0.1°C.) though temperature varied ±5°C.

BUILT-IN LINE VOLTAGE COMPENSATION
Chamber temperature remains constant (±0.1°C.) with a voltage change ±7 V. on 120 V.; ±15 V. on 240 V.

BUILT-IN RFI SUPPRESSION
Over 90% of Radio Frequency Interference eliminated.

BUILT-IN OVERTEMPERATURE PROTECTION:
Positive safeguard for equipment and workload—at no added cost!

MEMORY RING® TEMPERATURE CALIBRATING DIAL AND DIAL POINTER LOCK
Dual scale in °C. and °F.

U.L. LISTED
Wiring complete. Smaller model has line cord and plug, others have terminal box at rear of base.

THE VERSATILE BACKBONE OF COUNTLESS SCIENTIFIC AND PRODUCTION DEPARTMENTS

Long among the most popular ovens in the scientific and laboratory field . . . the "standard" oven for innumerable production applications—now dramatically improved to provide greater operational efficiency and dependability than ever

To insure maximum safety for equipment, workload and operator, Blue M has now made overtemperature protection standard on these ovens. Besides the immediate advantage this offers today, built-in OTP coupled with U.L. Listing will, we believe, help these units comply with new OSHA standards once these are firmly established and enforced.

These rugged, quality-built ovens are engineered to give years of continuous, dependable service in analytical laboratories and in general chemical work involving baking, drying, conditioning, preheating and other utility jobs. They are also ideal for processing light and small components in limited quantities. Please note that these ovens should not be stacked unless 6" is maintained between units. See Stacking Frames under Accessories on next page.

SOLID-STATE PROPORTIONAL CONTROL SYSTEM MATCHED TO A CHAMBER OF PROVEN DESIGN FOR UNRIVALED PERFORMANCE AND ECONOMY

POWER-O-MATIC 70 Control System puts the miracle of modern electronic technology to work to provide truly proportional straight line performance at a highly competitive price. Extremely compact and simple, POWER-O-MATIC 70 consists of a temperature sensitive resistance network exercising phase control on two SCRs. Voltage is controlled by a Zener Diode.

In operation, POWER-O-MATIC 70 provides a control tolerance of ±0.2°C with extremely fast response to temperature change. The response of the temperature sensor is measured in milliseconds. Overall performance is such as you might expect from temperature regulating instrumentation costing hundreds of dollars more. Now, thanks to this advanced control system, you can purchase a chamber which meets today's needs with the assurance that it can also be used for more critical work should the need arise in the future. (See Pages 12 and 13 for full details on the POWER-O-MATIC 70 Control System.)

UL®
Guide No. 165E9
File No. E30112

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY

SEE PAGE 16

BLUE M

GENERAL SPECIFICATIONS AND PRICES

CONSTRUCTION: Triple wall type with heat barriers to minimize heat conduction between joining faces.

Models OV-475A-2, OV-510A-2, OV-520C-2; quality 18-8 stainless, type 304, inside and out. Helic-arc welded. Models OV-472A-2, OV-490A-2, OV-500C-2: 2B Finish 18-8 stainless, type 304, interiors. Cold rolled steel exteriors, durable attractive blue enamel finish. All-welded.

BUILT-IN DIRECT LINE OVERTEMPERATURE PROTECTION: Automatically shuts down unit in the event of control failure. Prevents excessive temperature rise and resulting damage to equipment and workload.

INSULATION: All six sides have minimum 2 in. thickness of Fiberglas—fireproof, non-hygroscopic, will not settle.

NEW ETERNA HEATER BANKS: Open, low gradient—assure years of service. Cylindrical, supported by ceramic core and grooved, ceramic refractories. Alloy panel covers elements, shielding workload from radiant heat.

FRESH AIR INTAKE VENT: With adjustable cover.

EXHAUST VENT: With adjustable cover.

SHELVES AND BRACKETS (2): Designed for maximum airflow and support. Wire rod type reinforced. For all models with enameled steel exteriors, shelves are brightly nickel-plated steel. For all models with stainless exteriors, shelves and brackets are electropolished stainless. 2 in. adjustment for all models. 5 positions for smaller units, 8 for larger units.

DOOR: Fully insulated, double wall type. Interior face of type 304, 18-8 stainless. Newly redesigned to provide door plug to further reduce heat loss and improve temperature uniformity. Modern chrome-plated hinge, latch and strike insure tight closure. Double high temperature silicone rubber door seals eliminate leakage.

NEON PILOT LAMP: Red, denotes unit operation.

MOTOR WITH BUILT-IN THERMOGUARD® PROTECTION: Sealed ball bearing type designed for blower and high temperature duty. Ample horsepower for long, trouble free service. Manufacturer states 10 years of normal life. Exclusive vibrationless mounting.

DEFINITE DIRECTED AIR-FLOW: Multi-bladed blower, circulates heated air horizontally across working chamber uniformly. No special loading is required.

THERMOMETER: 0°C. to +260°C. glass, with 2°C. graduations, 12 in. long, white back, mercury filled.

WIRING: Complete, enclosed. All models U.L. Listed. OV-472A-2 and OV-475A have 6 ft. 3 wire cord and plug. Others have terminal box (3 wire cord and plug optionally available). See below.

ALL STAINLESS STEEL MODELS

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Maximum Watts	Voltage 60 Hz. A.C. Single Phase	Cubic Feet Capacity	Shipping Weight Lbs. (Kg.)	Complete Price With OTP	*Optional Cabinet Type Floor Stand (Cat. No.)
OV-475A-2	13 (33)	12 (31)	12 (31)	22 (55)	21 (53)	29 (73)	1000	*120 V.	1.0	85 (38)	$765.00	(FS-184) $90.00
OV-510A-2	19 (48)	15 (38)	18 (45)	29 (73)	24 (61)	37 (93)	1600	120 V.	3.0	155 (70)	920.00	(FS-186) 110.00
OV-520C-2	19 (48)	15 (38)	18 (45)	29 (73)	24 (61)	37 (93)	1600	**240V.	3.0	155 (70)	920.00	(FS-186) 110.00

ENAMELED STEEL EXTERIOR MODELS

OV-472A-2	13 (33)	12 (31)	12 (31)	22 (55)	21 (53)	29 (73)	1000	*120 V.	1.0	90 (40)	$650.00	(FS-184) $90.00
OV-490A-2	19 (48)	15 (38)	18 (45)	29 (73)	24 (61)	37 (93)	1600	120 V.	3.0	160 (72)	730.00	(FS-186) 110.00
OV-500C-2	19 (48)	15 (38)	18 (45)	29 (73)	24 (61)	37 (93)	1600	**240 V.	3.0	160 (72)	730.00	(FS-186) 110.00

*Available for 240 V. or 208 V./1 Ph. We will supply a separate autoformer package complete with line cord and plug. Simple installation. Specify Part No. E-17E-1-1 ..... $90.00 Each

**These models will operate reliably when connected to 208 Volt service. A 25% reduction in element power will result

STACKING FRAMES: Saves floor space, maintains safe and proper 6" distance between ovens. Formed angle construction, easy to install.
For OV-475 A-2/OV-472 A-2: Part No. M20-N1 ..... $95.00
For OV-510 A-2, OV-520C-2, OV-490A-2, OV-500 C-2:
Part No. M20-N2 ..... $95.00

DOUBLE GLASS OBSERVATION PANEL: In center of door; clear tempered glass. Stainless framing and trim. ***(For delivery with unit only.)***
For OV-472 series: 6½" W. x 8" H. viewing area.
Cat. No. GPA-100 ..... $75.00 installed
For OV-490 series: 9¼" W. x 12 ¾" H. viewing area.
Cat. No. GPA-101 ..... $95.00 Installed

AUTOMATIC SHUT-OFF TIMER: Built-in six hour timer and dial lock to control heating periods.
Part No. C12D-3 ..... $35.00 Installed

AUTOMATIC PROGRAM TIMERS: Built-in to control and program operating times. Mounted on base, right side.
Part No. C12A-1, 24 Hour Time Cycle ..... $65.00 Installed
Part No. C12A-3, 7 Day Time Cycle ..... $85.00 Installed

NOTE: For field installation of above timers on 240 V. units, specify autoformer Part No. E17A-2-1 ..... $14.00 Each

LEAD-IN PORTS: Aluminum tube with adjustable stainless cover. Installed in rear, right, left walls or in door. Other locations permissible, multiple ports available. Please specify (a) diameter (b) location.
1¾" O.D., $1^{11}/_{16}$" I.D. ..... $15.00 Installed
3" O.D., 2⅞" I.D. ..... $45.00 Installed

EXTRA THERMOMETER: Part No. CO1C-3 .... $10.00 Each

EXTRA SHELVES AND BRACKETS: As described above.
OV-472A-2: Part No. MO4-A205 ..... $17.00 Each
OV-475A-2: Part No. MO4-A105 ..... $24.00 Each
OV-490A-2/OV-500C-2: Part No. MO4-A206 ... $20.00 Each
OV-510A-2/OV-520C-2: Part No. MO4-A106 ... $33.00 Each

3 WIRE CORD AND PLUG: Rubber covered 6 ft. long For customer installation.
For OV-490A-2 & OV-510A-2, Part No. EO7A-2...$11.00 Ea.
For OV-500C-2 & OV-520C-2, Part No. EO7A-4...$14.00 Ea.

Shipping weights shown are for standard models. Units ordered with accessories may require special packing. Increasing shipping weight slightly.

BLUE M

STABIL-THERM®

Floor Type
mechanical convection
Horizontal Air-Flow
AGING OVENS
with

POWER-O-MATIC 70® PATENTED

solid-state proportioning control system and built-in overtemperature protection

TEMPERATURE RANGE: +40°C. to +204°C (+400°F.)

TEMPERATURE CONTROL TOLERANCE: ±0.2°C.

TEMPERATURE STABILITY: ±0.4°C.

BUILT-IN AMBIENT TEMPERATURE COMPENSATION
Chamber temperature remains constant (±0.1°C.) though temperature varied ±5°C.

BUILT-IN LINE VOLTAGE COMPENSATION
Chamber temperature remains constant (±0.1°C.) with a voltage change ±15 V. on 240 V.

BUILT-IN RFI SUPPRESSION
Over 90% of Radio Frequency Interference eliminated.

BUILT-IN OVERTEMPERATURE PROTECTION
Positive safeguard for equipment and workload—at no added cost!

MEMORY RING® TEMPERATURE CALIBRATING DIAL AND DIAL POINTER LOCK
Dual scale in °C. and °F.

MEETS TEST REQUIREMENTS OF ASTM METHOD D573-53

ASTM test specifications require air, at fixed elevated temperatures, to pass over the surface of the material being tested. Being warmer than normal, this temperature controlled heated air quickly simulates an aged condition which would take many years to occur under natural environmental conditions.

Blue M Aging Ovens are ideal for aging rubber, textiles, plastics, insulations, roof coverings, varnishes and paints. Three sizes suspend 110, 164, or 238 samples simultaneously. Removable sample rack . . . permits use as standard utility oven.

These quality units are guaranteed to outperform and outlast any unit of the same temperature range and price with regard to work chamber air temperature uniformity at multiple points; temperature drift over extended periods; control performance. Complete thermocouple survey on request.

SOLID-STATE PROPORTIONAL CONTROL SYSTEM MATCHED TO A CHAMBER OF PROVEN DESIGN FOR UNRIVALED PERFORMANCE AND ECONOMY

POWER-O-MATIC 70 Control System puts the miracle of modern electronic technology to work to provide truly proportional straight line performance at a highly competitive price. Extremely compact and simple, POWER-O-MATIC 70 consists of a temperature sensitive resistance network exercising phase control on two SCRs. Voltage is controlled by a Zener Diode.

In operation, POWER-O-MATIC 70 provides a control tolerance of ±0.2°C. with extremely fast response to temperature change. The response of the temperature sensor is measured in milliseconds. Overall performance is such as you might expect from temperature regulating instrumentation costing hundreds of dollars more. Now, thanks to this advanced control system, you can purchase a chamber which meets today's needs with the assurance that it can also be used for more critical work should the need arise in the future. (See Pages 12 and 13 for full details on the POWER-O-MATIC 70 Control System.)

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY BLUE M

SEE PAGE 16

BLUE M

GENERAL SPECIFICATIONS AND PRICES

BUILT-IN DIRECT LINE OVERTEMPERATURE PROTECTION: Automatically shuts down unit in the event of control failure. Prevents excessive temperature rise and resulting damage to equipment and workload. Completely separate from control circuit.

ETERNA ELEMENTS: Black-Heat; "Controlled" low-watt density, even at maximum temperature. Reducing voltage reduces watt density. No thermal shock, no screws or welded parts, **no radiant heat.**

SAMPLE SUSPENSION RACKS: Double stretch suspension type (use as suspended type if desired). From 110 to 238 samples may be suspended at one time. All clips 1½ in. centers. Racks have maximum adjustment up or down, support rods threaded full length are nickel-plated. Racks may be removed and replaced with shelves.

VOLTMETER: Power input indication.

MOTOR: Quality, all-angle heavy duty motor designed especially for blower duty and elevated temperatures. Ample horsepower to give long, trouble free service. Has exclusive Blue M vibrationless mounting design.

DEFINITE DIRECTED AIR-FLOW: Multi-bladed blower, statically balanced, circulates heated air horizontally across working chamber to produce uniform heat distribution. No need for special loading.

ADJUSTABLE ONE-PASS AIR-FLOW SYSTEM: Air passes over heaters and through chamber only once if necessary. Permits almost 100% exhaust of fumes. If high exhaust needed, higher K.W. rating may be required to obtain maximum temperature. Contact factory.

INTERIOR: All models and inside of door(s) type 304, 18-8 stainless—excellent resistance to heat and corrosion.

EXTERIOR: All-welded heavy gauge cold rolled steel, reinforced. Baked-on attractive blue enamel. Note: Exterior and interior chambers employ specially designed barriers to minimize heat conduction between joining faces.

DOOR(S) AND HARDWARE: Double wall. Exclusive adjustable no-slam, cam action latch and chrome-plated hinges. Double silicone rubber seals plus stainless steel spring heat barriers around entire door perimeter. All models with working chambers larger than 25" wide I.D. have two doors but no center mullion. Others have one door.

INSULATION: Minimum 4 in. thick blanket of non-hygroscopic, fireproof, Fiberglas; will not settle or deteriorate.

SHELVES (2): Wire rod type reinforced, nickel-plated steel, adjustable; with double-runner type shelf supports. Series POM-1326 has tubular frame type expanded shelves.

READY-READ TEMPERATURE INDICATOR: 3½" diameter —for easier, more efficient operation. Dual scale in degrees C. and F.

WIRING: Complete, totally enclosed. Terminal box provided. Simply connect to power line. Meets N.E. Code as amended.

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Total KVA	Voltage 60 Hz. A.C. Single Phase	Cubic Feet Capacity	Shipping Weight Lbs. (Kg.)	Number of Clips	†Complete Price With OTP
POM-1126C-3	20 (51)	18 (45)	20 (51)	35 (88)	30 (76)	70 (177)	2.7	240 V.	4.1	500 (227)	110	$1465.00
POM-1226C-3	25 (63)	20 (51)	20 (51)	40 (101)	32 (80)	70 (177)	3.7	240 V.	5.8	620 (281)	164	1715.00
*POM-1326C-3	38 (95)	20 (51)	25 (63)	53 (133)	32 (80)	62 (157)	5.2	240 V.	10.0	850 (386)	238	2355.00

* Has two doors but no center mullion. (Standard floor type.)
†Includes cabinet type stand, except Model POM-1326C-3 which is floor type.
Units operate satisfactorily when connected to 208 volt service. A 25% reduction in element power will result.

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories

Series Number	Extra Shelves and Brackets—as described above: Part Number	Price Each	*Recording and Indicating Thermometers (Choice of 2 Available for Each Oven): Part Number	Temperature Range	Chart Rotation	**Extra Charts 100/Box	Built-in Automatic Program Timers. To Control Operating Periods
POM-1126	MO4-A216	$27.00	CO2A-2-3	+40°C. to +230°C.	1 Day	CO10A-2-7	Part No. C12A-1 24-Hr. $65.00 Installed
POM-1226	MO4-A217	28.00	CO2A-2-4	+40°C. to +230°C.	7 Day	CO10A-2-8	Part No. C12A-3 7-Day $85.00 Installed
POM-1326	MO4-B202	48.00					

*Installed price: $385.00 all ranges. Instrument bracket mounted on right side near top. Adds approx. 17" to overall width of unit. NOTE: When this instrument is ordered, standard temperature indicator is not supplied
**Additional charts: $9.00/Box

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly

SEE ADDITIONAL ACCESSORIES AND SPARE PARTS ON PAGES 164-167.

BLUE M

STABIL-THERM®

Bench Type
mechanical convection
Horizontal Air-Flow
MINIATURE BATCH OVENS
with
POWER-O-MATIC 70®
PATENTED

solid-state proportioning control system and built-in overtemperature protection

2 TEMPERATURE RANGES:
+40°C. to +204°C. (+400°F.) or
+40°C. to +300°C. (+572°F.)

TEMPERATURE CONTROL TOLERANCE: ±0.2°C.

TEMPERATURE STABILITY: ±0.4°C.

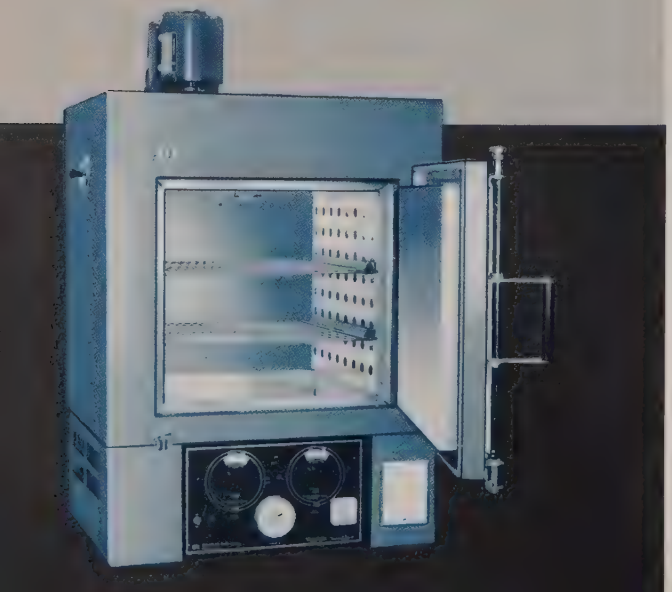
BUILT-IN AMBIENT TEMPERATURE COMPENSATION
Chamber temperature remains constant (±0.1°C.) though temperature varied ±5°C.

BUILT-IN LINE VOLTAGE COMPENSATION
Chamber temperature remains constant (±0.1°C.) with a voltage change ±7 V. on 120 V.; ±15 V. on 240 V.

BUILT-IN RFI SUPPRESSION
Over 90% of Radio Frequency Interference eliminated.

BUILT-IN OVERTEMPERATURE PROTECTION
Positive safeguard for equipment and workload—at no added cost!

MEMORY RING® TEMPERATURE CALIBRATING DIAL AND DIAL POINTER LOCK
Dual scale in °C. and °F.



BLUE M ETERNA HEATER BANKS ARE SAFER, ENCLOSED IN TOP OVEN SECTION. ANY SPILLAGE EASILY REMOVED FROM BOTTOM PLATE.

Quick, easy to read, visual indication of oven temperatures throughout the entire range—with accuracy and confidence. Here is a modern unit to conduct an unusual number of laboratory tests or small piece production runs. Recirculating horizontal air-flow accomplished by means of turbo blower and heavy duty motor utilizing Blue M's exclusive vibrationless mounting design. Air-flow design permits processing of flat pieces without special loading and consistent results. Improved efficiency and economy.

Blue M Eterna heating elements are located in the top section of the unit—leaving bottom free from possible spillage damage. They are completely shielded—no radiant heat, safer operation. A distinct advantage—at no added cost.

These ovens are ruggedly built to give many years of superb service for analytical laboratories and general chemical work involving baking, drying, conditioning, preheating as well as other more exacting jobs. From the laboratory, there is occasioned the need to process light and small components on a limited production basis. This series of units serves admirably in this capacity. All models now U.L. Listed.

SOLID-STATE PROPORTIONAL CONTROL SYSTEM MATCHED TO A CHAMBER OF PROVEN DESIGN FOR UNRIVALED PERFORMANCE AND ECONOMY

POWER-O-MATIC 70 Control System puts the miracle of modern electronic technology to work to provide truly proportional straight line performance at a highly competitive price. Extremely compact and simple, POWER-O-MATIC 70 consists of a temperature sensitive resistance network exercising phase control on two SCRs. Voltage is controlled by a Zener Diode.

In operation, POWER-O-MATIC 70 provides a control tolerance of ±0.2°C. with extremely fast response to temperature change. The response of the temperature sensor is measured in milliseconds. Overall performance is such as you might expect from temperature regulating instrumentation costing hundreds of dollars more. Now, thanks to this advanced control system, you can purchase a chamber which meets today's needs with the assurance that it can also be used for more critical work should the need arise in the future. (See Pages 12 and 13 for full details on the POWER-O-MATIC 70 Control System.)

UL®
Guide No. 165E9
File No. E30112

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM
WARRANTY BLUE M
SEE PAGE 16

BLUE M

GENERAL SPECIFICATIONS AND PRICES

CONSTRUCTION: Triple wall type with Blue M ETERNA HEATER BANK enclosed in top oven section.

Series OV-560SSA, OV-580SC: Quality 18-8 stainless, type 304, inside and out. Excellent corrosion resistance.

Series OV-560A, OV-580C: 2B Finish 18-8 stainless, type 304, interiors. Housing, door, base and back of heavy steel. All welded, reinforced for strength. Exterior attractive blue baked-on enamel; durable and scratchproof.

INSULATION: 3 in. Fiberglas on all six sides. Fireproof, non-hygroscopic, will not settle or deteriorate. Forms perfect thermal equilibrium at elevated temperatures.

BUILT-IN DIRECT LINE OVERTEMPERATURE PROTECTION: Automatically shuts down unit should control fail. Prevents excessive temperature rise and resulting damage to equipment/workload. Separate from control circuit.

NOTE HOLDER: Metal card holder provides convenient place to keep records of unit performance, tests, etc.

READY-READ TEMPERATURE INDICATOR: 3½" dia.—for easier, more efficient operation. Dual scale in degrees C. and F. in ranges to match oven.

SHELVES AND BRACKETS (2): Nickel-plated steel, wire type, Series OV-560A/580C. Stainless, Series OV-560SSA/580SC. Double runner stainless brackets; shelves adjustable to 7 positions.

AIR INTAKE/EXHAUST/AIR-FLOW: Adjustable. Heated air propelled HORIZONTALLY. High velocity air proportioned as required. Snap-in stainless covers.

DOOR AND HARDWARE: Double wall. Interior face 18-8 stainless, type 304, 2B finish. Adjustable no-slam, cam action latch and chrome-plated hinges maintain positive seal.

BLUE M ETERNA HEATER BANK: Safer: enclosed in top oven section. No radiant heat. Cylindrical element; helically coiled resistance wire withstanding +2150°F., supported by grooved, ceramic refractories and ceramic core. Refractories have high dielectric strength, are impervious to common acids and moisture, and can stand +2600°F.

NEON PILOT LAMP: Red, denotes unit operation.

MOTOR WITH BUILT-IN THERMOGUARD® PROTECTION: Sealed ball bearing type designed for blower and high temperature duty, and long, trouble free service. Manufacturer states 10 years normal life. Vibrationless mounting.

DEFINITE DIRECTED AIR-FLOW: Multi-bladed blower, dynamically balanced, circulates heated air across chamber for uniform heat distribution. No need for special loading.

RECESSED PROTECTED CONTROL PANEL: On front of oven. Houses pilot lamp, controls, etc. Removable.

WIRING: Complete, totally enclosed, and U.L. Listed. Terminal boxes provided for all models.

TEMPERATURE RANGE: TO +204°C. (+400°F.)

ALL STAINLESS STEEL MODEL

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Total KVA	Voltage 60 Hz. A.C. Single Phase	Cubic Feet Capacity	Shipping Weight Lbs. (Kg.)	Complete Price With OTP
OV-560SSA-2	19 (48)	17½ (44)	18 (45)	29 (73)	30 (76)	48 (120)	2.4	*120 V.	3.4	280 (127)	$1150.00

ENAMELED STEEL EXTERIOR MODEL

OV-560A-2	19 (48)	17½ (44)	18 (45)	29 (73)	30 (76)	48 (120)	2.4	*120 V.	3.4	280 (127)	$890.00

TEMPERATURE RANGE: TO +300°C. (+572°F.)

ALL STAINLESS STEEL MODEL

OV-580SC-2	19 (48)	17½ (44)	18 (45)	29 (73)	30 (76)	48 (120)	4.5	**240 V.	3.4	280 (127)	$1410.00

ENAMELED STEEL EXTERIOR MODEL

OV-580C-2	19 (48)	17½ (44)	18 (45)	29 (73)	30 (76)	48 (120)	4.5	**240 V.	3.4	280 (127)	$1195.00

*Units available for 240 V. and 208 V./1 Ph. We will supply a separate autoformer package complete with line cord and plug. Simple installation. Specify Part No. E-17E-1-2 ..... $120.00 Each

**These models will operate reliably when connected to 208 volt service. A 25% reduction in element power will result

NOTE: Single phase unit can be connected to two wires of three phase line

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories

AUTOMATIC SHUT-OFF TIMER: Built-in six hour type for control of procedures.
Part No. C12D-3. 6 Hour ..... $35.00 Installed

AUTOMATIC PROGRAM TIMERS:
To control operating periods.
Part No. C12A-1. 24 Hour ..... $65.00 Installed
Part No. C12A-3. 7 Day ..... $85.00 Installed
NOTE: For field installation of above timers on 240 V. units, specify autoformer Part No. E17A-2-1 ..... $14.00 Each

EXTRA SHELF AND (2) BRACKETS: as described above.
Part No. MO4-A207 (Nickel-plated steel) $24.00/set
Part No. MO4-A107 (Stainless steel) $37.00/set

LEAD-IN PORT AND COVER: 3 in. dia. in center of back wall. Ideal for electrical power connections to components under test. Other sizes/locations possible. Specify.
Cat. No. POR-100C ..... $45.00 Installed

CABINET TYPE FLOOR STAND: with door and latch. 28¾" W. x 21" D. x 27" H. Approx. ship. wt.: 100 lbs.
Cat. No. FS-146 ..... $110.00

DOUBLE GLASS OBSERVATION PANEL: Built into door center, tempered glass. Viewing Area: 9¼" W. x 12¾" H.
For delivery with unit only.
Cat. No. GPA-101 ..... $95.00 Installed
Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly.

BLUE M

STABIL-THERM®

CHROMATOGRAPHY OVENS

Hazard Safe Design

with heli-arc welded interior and

POWER-O-MATIC 70® PATENTED

solid-state proportioning control system and built-in overtemperature protection

HIGHER TEMPERATURE RANGE:
+40°C. to +180°C. (+356°F.)

TEMPERATURE CONTROL TOLERANCE: ±0.2°C.

TEMPERATURE STABILITY: ±0.4°C.

BUILT-IN AMBIENT TEMPERATURE COMPENSATION
Chamber temperature remains constant (±0.1°C.) though temperature varied ±5°C.

BUILT-IN LINE VOLTAGE COMPENSATION
Chamber temperature remains constant (±0.1°C.) with a voltage change ±15 V. on 240 V.

BUILT-IN RFI SUPPRESSION
Over 90% of Radio Frequency Interference eliminated.

BUILT-IN OVERTEMPERATURE PROTECTION
Positive safeguard for equipment and workload—at no added cost!

HORIZONTAL MECHANICAL AIR-FLOW, PLUS UNIQUE AIR-FLOW/DAMPER/INTAKE DESIGN FOR SAFER OPERATION

a) Full Open: Nearly 100% exhaust—0% recirculation (a true one pass air-flow design)
b) Full Closed: 25% exhaust—75% recirculation (factory set to insure minimum exhaust)
c) Filtered Air Intake: prevents room contaminates from entering air chamber.

MEMORY RING® TEMPERATURE CALIBRATING DIAL AND DIAL POINTER LOCK
Dual scale in °C. and °F.

LARGER IN SIZE
CAPACITY OF 10 CHROMATOGRAMS
10 PAPERS UP TO 22" W. x 24" H.
INDIVIDUALLY ACCESSIBLE

Blue M's new design and approach for a chromatography oven guarantees greater safety and reliability. Besides the POWER-O-MATIC 70 Control System without arcing components, relays, etc., our unique air-flow system with external damper control proportions the ratio of exhaust air to the recirculated air. When FULL OPEN the heated air is convected only once over the heaters and paper chromatograms and exhausted outward or through a fume hood exhaust. There is no possible build up of a hazardous atmosphere. Even when FULL CLOSED a 25% positive exhaust is maintained with 75% recirculation. An aluminum filter, easily replaceable, is mounted over the large fresh air intake to prevent room contaminates from entering the chamber and passing over the paper chromatograms.

An all stainless steel pull-out rack moves forward easily and permits individual paper chromatograms to be removed as required. Overall construction provides a quality cabinet of maximum reliability, convenience, efficiency and safety.

If ever shelves are required in lieu of the standard pull-out rack supplied as standard, please contact factory for shelf and bracket information.

SOLID-STATE PROPORTIONAL CONTROL SYSTEM MATCHED TO A CHAMBER OF PROVEN DESIGN FOR UNRIVALED PERFORMANCE AND ECONOMY

POWER-O-MATIC 70 Control System puts the miracle of modern electronic technology to work to provide truly proportional straight line performance at a highly competitive price. Extremely compact and simple, POWER-O-MATIC 70 consists of a temperature sensitive resistance network exercising phase control on two SCRs. Voltage is controlled by a Zener Diode.

In operation, POWER-O-MATIC 70 provides a control tolerance of ±0.2°C. with extremely fast response to temperature change. The response of the temperature sensor is measured in milliseconds. Overall performance is such as you might expect from temperature regulating instrumentation costing hundreds of dollars more. Now, thanks to this advanced control system, you can purchase a chamber which meets today's needs with the assurance that it can also be used for more critical work should the need arise in the future. (See Pages 12 and 13 for full details on the POWER-O-MATIC 70 Control System.)

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM
WARRANTY
SEE PAGE 16

BLUE M

GENERAL SPECIFICATIONS AND PRICES

BUILT-IN DIRECT LINE OVERTEMPERATURE PROTECTION: Automatically shuts down unit in the event of control failure. Prevents excessive temperature rise and resulting damage to equipment and workload. Completely separate from control circuit.

ETERNA ELEMENTS: Black-Heat; "Controlled" low-watt density, even at maximum temperature. Reducing voltage reduces watt density. No thermal shock, no screws or welded parts, **no radiant heat;** continuous elements with external connections, located remote from work chamber.

VOLTMETER: Power input indication.

SEALED MERCURY SWITCHES: Place unit and blower into operation.

MOTOR: Totally enclosed, ball bearing, Class I, Group D. Separate motor starter switch allows blower to operate independently of heaters.

DEFINITE DIRECTED AIR-FLOW: Multi-bladed alloy blower statically balanced circulates heated air horizontally across working chamber to produce uniform heat distribution.

AIR INTAKE/EXHAUST/DAMPER: Large fresh air intake provided with aluminum filter. Prevents room contaminates from entering work chamber. The extra large stainless steel exhaust and damper is externally adjustable to control the ratio of exhaust air to recirculated air. A desirable safety feature.

EXTERIOR: Heavy gauge cold rolled steel; reinforced with minimum through bracing . . . all welded construction for ruggedness. Attractive durable FORMICA white enamel finish.

INTERIOR: Type 304, 18-8 stainless steel including face of door and door perimeter . . . excellent resistance to corrosion and heat. Heli-arc welded.

DOOR AND HARDWARE: Double wall. Exclusive adjustable no-slam, cam action latch and new chrome-plated hinges maintain air-tight seal. Silicone rubber seal. Door finished in light blue enamel for modern contrast.

INSULATION: Minimum three inch thick blanket of non-hygroscopic, fireproof, Fiberglas wool; will not settle.

PULL-OUT RACK: Type 304, stainless steel with (10) ¼" diameter rods of a similar alloy. Rack accommodates (10) paper chromatograms up to 22" W. x 24" H.

READY-READ TEMPERATURE INDICATOR: 3½" diameter—for easier, more efficient operation. Dual scale in degrees C. and F.

WIRING: Complete, totally enclosed. All connections **soldered** for greater permanency. Terminal box provided. Simply connect to power line. Meets N.E. Code, as amended.

Model Number	Inside Dimensions Inches (Cm.)			Overall Dimensions Inches (Cm.)			Total KVA	Voltage 60 Hz. A.C. Single Phase	Cubic Feet Capacity	Shipping Weight Lbs. (Kg.)	Complete Price With OTP
	W.	D.	H.	W.	D.	H.					
POM-1533C-2	24 (61)	20 (51)	30 (76)	39 (98)	31 (78)	53 (133)	3.3	*240 V.	8.3	475 (215)	$2160.00

*This unit will operate reliably when connected to 208 volt service. A 25% reduction in element power will result
NOTE Single phase unit can be connected to two wires of a three phase line

BLUE M

STABIL-THERM®

ULTRA-UNIFORMITY VACUUM OVENS

mechanical convection

Horizontal Air-Flow

(Encircles Work Chamber)

with

POWER-O-MATIC 70® PATENTED

solid-state proportioning control system and built-in overtemperature protection

TEMPERATURE RANGE:
20°C. above ambient to +200°C. (+392°F.)

TEMPERATURE UNIFORMITY
±1°C. or better

TEMPERATURE STABILITY
±0.4°C.

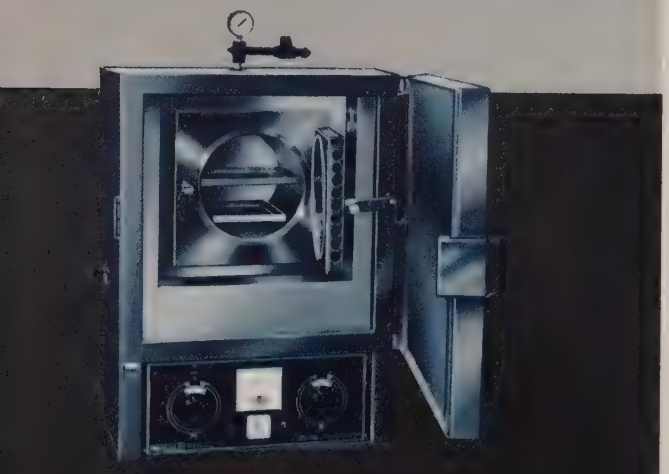
PULL-DOWN TIME: To 50 microns of mercury
POM-11VC-2: 20 minutes
POM-17VC-2: 15 minutes

BUILT-IN AMBIENT TEMPERATURE COMPENSATION
Chamber temperature remains constant (±0.1°C.) though temperature varied ±5°C.

BUILT-IN LINE VOLTAGE COMPENSATION
Chamber temperature remains constant (±0.1°C.) with a voltage change ±7 V. on 120 V.; ±15 V. on 240 V.

BUILT-IN RFI SUPPRESSION
Over 90% of Radio Frequency Interference eliminated.

MEMORY RING® TEMPERATURE CALIBRATING DIAL
Dual scale in °C. and °F.



THE FINEST VACUUM OVENS EVER BUILT FOR ULTRA-UNIFORMITY PROCESSING

These Blue M Mechanical Convection Vacuum Ovens are without question the finest units ever engineered for processing under rigid temperature uniformity requirements They feature a unique oven-within-an-oven design: the inner vacuum workload chamber is installed inside a carefully built temperature controlled heating chamber. Workload processing, in effect, is thus conducted in an envelope environment having the temperature precisely regulated to an extent impossible to duplicate under normal gravity conditions. Typically, air temperature uniformity within the outer heat chamber is ±1.0°C. at +100°C. Since the sealed inner processing chamber is completely surrounded by this environment, ±1.0°C. or better temperature uniformity throughout the entire range is assured.

In addition, rapid cool-down is easily accomplished. The outer chamber door is simply opened. The inner processing chamber remains sealed and under vacuum. The workload is unaffected.

These units feature the exclusive POWER-O-MATIC 70 Solid-State Proportioning Control for superior straight-line performance and built-in direct line overtemperature protection for safety. They have a vacuum rating from atmosphere to 50 microns or less when used with a suitable auxiliary vacuum pump.

These fine units reflect Blue M's many years experience in the design and manufacture of ovens and vacuum equipment. If your work requires extremely close temperature uniformity under vacuum, these are unquestionably the finest, most reliable ovens you can buy.

Please note that these ovens are also available as "packaged" facilities—complete with high quality vacuum pump and cabinet type floorstand—assembled and fully tested. They are similar in appearance to the units shown on page 60.

SOLID-STATE PROPORTIONAL CONTROL SYSTEM MATCHED TO A VACUUM CHAMBER OF PROVEN DESIGN FOR UNRIVALED PERFORMANCE AND ECONOMY

POWER-O-MATIC 70 Control System puts the miracle of modern electronic technology to work to provide truly proportional straight line performance at a highly competitive price. Extremely compact and simple, POWER-O-MATIC 70 consists of a temperature sensitive resistance network exercising phase control on two SCRs. Voltage is controlled by a Zener Diode.

In operation, POWER-O-MATIC 70 provides a control tolerance at ±0.2C. with extremely fast response to temperature change. The response of the temperature sensor is measured in milliseconds. Overall performance is such as you might expect from temperature regulating instrumentation costing hundreds of dollars more. Now, thanks to this advanced control system, you can purchase a chamber which meets today's needs with the assurance that it can also be used for the most exacting and critical vacuum processes.

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY BLUE M

SEE PAGE 16

BLUE M

GENERAL SPECIFICATIONS AND PRICES

CONSTRUCTION (OUTER CHAMBER): Triple wall. Heli-arc welded heavy gauge cold rolled steel exterior. Attractive, durable blue baked-on enamel finish. Interiors are 18-8 type 304 stainless, except large models which are painted steel.

INSULATION: All six sides have a minimum 2 in. thick blanket of Fiberglas, non-hygroscopic, will not settle.

ETERNA HEATER BANKS: Open, low gradient. Assure years of service. Cylindrical, supported by ceramic core and grooved ceramic refractories.

INTAKE AND EXHAUST VENTS: One each, with adjustable covers, for properly regulating air circulation around the entire vacuum chamber.

OUTER DOOR: Fully insulated, double wall type. Exclusive adjustable no-slam, cam action latch and chrome-plated hinges insure tight closure. Silicone rubber seal. Door can be opened and closed as desired without disturbing conditions inside vacuum processing chamber.

VACUUM CHAMBER AND INNER DOOR: Heavy gauge 18-8 stainless steel, type 304, heli-arc welded and passivated. Stainless steel door has exclusive adjustable no-slam cam action latch and hinges. Silicone "O" ring gasket assures positive seal.

NEON PILOT LAMP: Red, denotes unit operation.

BUILT-IN DIRECT LINE OVERTEMPERATURE PROTECTION: Automatically shuts down unit. Prevents excessive temperature rise and resulting damage to equipment and workload. Completely separate from control circuit.

AIR CIRCULATION: Quality ball-bearing motor and balanced multi-bladed blower designed especially for these ovens circulates heated air horizontally across exterior of vacuum chamber uniformly to maintain processing conditions constant.

VOLTMETER: Indicates voltage across heating elements.

INDICATING PYROMETER AND THERMOCOUPLE: For accurate indication of temperature inside vacuum chamber. Low resistance type with accuracy of ±2% of scale range. Dual scale 0°F. to +650°F./0°C. to +343°C. with 5°F. scale divisions, 3½" long. Includes special Iron/Constantan thermocouple encased in magnesium oxide and protective sheath.

SHELVES (2): Solid stainless steel, trimmed with raised stainless edges for extra strength. Sizes: POM-11VC-2 center shelf 10" W. x 12" D., lower shelf 7" W. x 12" D.; POM-17VC-2 center shelf 16" W. x 16" D., lower shelf 12" W. x 16" D.

MANIFOLD: Mounted on top of oven. Includes quality pressure gauge and brass valve. Second valve mounted at rear.

WIRING: Complete, enclosed and meets N.E. Code, as amended. Three-wire line cord and plug for smaller models. Large model has terminal box at rear of base.

MODELS WITHOUT VACUUM PUMP AND FLOOR STAND

Model Number	Inside Dimensions Inches (Cm.) Dia.	Depth	Overall Dimensions Inches (Cm.) W.	D.	H.	Total KVA	*Voltage 60 Hz. A.C. Single Phase	Shipping Weight Lbs. (Kg.)	Complete Price With OTP
POM-11VC-2	10 (25)	10¼ (26)	27 (68)	28 (70)	43 (108)	2.0	240 V.	350 (159)	$1850.00
POM-17VC-2	16 (40)	17¼ (44)	33 (84)	38 (95)	55 (138)	4.4	240 V.	500 (227)	3140.00

"PACKAGED" MODELS WITH PUMP AND FLOOR STAND

(Includes above Vacuum Oven, Cabinet Type Floor Stand, and quality Vacuum Pump—completely assembled and tested.)

POM-13VC-2	10 (25)	10¼ (26)	27 (68)	28 (70)	72 (133)	2.8	240 V.	450 (204)	$2955.00
POM-19VC-2	16 (40)	17¼ (44)	33 (84)	38 (95)	76 (190)	5.4	240 V.	650 (295)	4280.00

*Units will operate reliably on 208 V. at 25% reduced power. When ordered with vacuum pumps also specify Part No. E17E-1-4 . $140.00 Each

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories

SEPARATE VACUUM PUMP: Quality built two-stage unit with ample capacity to produce oven vacuum rating of 50 microns or less. Toggle switch turns pump on and off. Complete with line cord and plug. Installation by user as required.

(POM-11VC-2)
Part No. E12A-2, 240 V./1 Ph./60 Hz. A.C. $475.00

(POM-17VC-2)
Part No. E12A-3, 240 V/1 Ph./60 Hz. A.C. $655.00

SEPARATE CABINET TYPE FLOOR STAND: Heavy steel construction, finished in attractive, durable blue enamel. Matches unit proper. Has auxiliary shelf and door. Designed also to accommodate vacuum pumps listed at factory or later as required.

(POM-11VC-2)
Cat. No. FS-173 (27" W. x 22" D. x 29" H.) $170.00

(POM-17VC-2)
Cat. No. FS-174 (33" W. x 27" D. x 21" H.) $170.00

EXTRA THERMOCOUPLE: As described above.
Part No. C11B-1-4 ..... $25.00

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly.

BLUE M

STABIL-THERM®

VACUUM OVENS

with

POWER-O-MATIC 70® PATENTED

solid-state proportioning control system and built-in overtemperature protection

TEMPERATURE RANGE
20°C. above ambient +260°C. (+500°F.)

BUILT-IN AMBIENT TEMPERATURE COMPENSATION
Chamber temperature remains constant though ambient varies between +21°C. and +32°C.

BUILT-IN LINE VOLTAGE COMPENSATION
Chamber temperature remains constant with a line voltage of 111-125 volts (215-245 volts on 240 volt units).

BUILT-IN RFI SUPPRESSION
Over 90% of Radio Frequency Interference eliminated.

BUILT-IN OVERTEMPERATURE PROTECTION
Positive safeguard for equipment and workload—at no added cost!

PULL-DOWN TIME: To 50 microns of mercury
POM-6VA-2: 10 minutes
POM-10VA-2 and POM-12VA-2: 20 minutes
POM-16VC-2 and POM-18VC-2: 15 minutes

TEMPERATURE STABILITY
Maximum deviation over a 24-hour period
All models: ±1.0°C.

MEMORY RING® TEMPERATURE CALIBRATING DIAL
Dual scale in °C. and °F.

QUALITY, PERFORMANCE, SAFETY FOR A MODERATE INVESTMENT

These popular Blue M Stabil-Therm Vacuum Ovens have been designed to allow the laboratory specialist concerned with small-part vacuum processing to select a quality chamber at a highly competitive price. Exclusive POWER-O-MATIC 70 Solid-State Proportioning Control provides the superior straight-line temperature performance required to meet today's more rigid quality control requirements while built-in direct line overtemperature protection helps insure the safety of valuable workloads. When coupled with the construction features detailed on the opposite page, you have ovens that will satisfy the most discriminating buyer.

The units have a vacuum rating from atmosphere to 50 microns or less when used with a suitable auxiliary vacuum pump. A built-in outlet on the two larger models permits simple plug-in of the pump. Pump operation is controlled by a separate panel-mounted switch and is protected by its own fuse. Ovens under test retain vacuum with minimal losses overnight without relying on pump—proof of superior performance.

Please note that all ovens proper are listed by Underwriters' Laboratories.

Blue M also offers these ovens as "packages"—complete with built-in pumps and cabinet type floor stands, ready to plug in and operate.

SOLID-STATE PROPORTIONAL CONTROL SYSTEM MATCHED TO A CHAMBER OF PROVEN DESIGN FOR UNRIVALED PERFORMANCE AND ECONOMY

POWER-O-MATIC 70 Control System puts the miracle of modern electronic technology to work to provide truly proportional straight line performance at a highly competitive price. Extremely compact and simple, POWER-O-MATIC 70 consists of a temperature sensitive resistance network exercising phase control on two SCRs. Voltage is controlled by a Zener Diode.

In operation, POWER-O-MATIC 70 provides a control tolerance of ±0.5°C. with extremely fast response to temperature change. The response of the temperature sensor is measured in milliseconds. Overall performance is such as you might expect from temperature regulating instrumentation costing hundreds of dollars more. Now, thanks to this advanced control system, you can purchase a chamber which meets today's needs with the assurance that it can also be used for more critical work should the need arise in the future. (See Pages 12 and 13 for full details on the POWER-O-MATIC 70 Control System.)

UL®
Guide No 165E9
File No E30112

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY BLUE M

SEE PAGE 16

BLUE M

GENERAL SPECIFICATIONS AND PRICES

CONSTRUCTION: Interior heavy gauge 18-8 stainless steel, type 304. Exterior heavy gauge steel finished in attractive baked-on blue enamel. Front plate of heavy stainless steel especially machined for positive seal. Heli-arc welded throughout.

INSULATION: 3 in. thick minimum Fiberglas blankets all areas. Moisture-proof; will not settle or deteriorate with age.

DOOR: Insulated with Fiberglas. Exclusive bright chrome-plated adjustable no-slam, cam action latch and hinges. Durable Bakelite handle. Silicone "O" ring gasket is remote from heat zone for longer life. Replacement gaskets available.

HEATING ELEMENTS: Low-watt density. Wrap-around design encircles exterior of vacuum chamber. Designed for long-life, efficient service.

BUILT-IN DIRECT LINE OVERTEMPERATURE PROTECTION: Automatically shuts down unit. Prevents excessive temperature rise and resulting damage to equipment and workload. Completely separate from control circuit.

VOLTMETER: Indicates voltage across heating elements.

INDICATING PYROMETER AND THERMOCOUPLE: Low resistance type with accuracy at ±2% of scale range. Dual scale 0°F. to +650°F./0°C. to +343°C. with 5°F. scale division, 3½" long. Includes special Iron/Constantan thermocouple encased in magnesium oxide and protective sheath.

SHELVES (2): Solid stainless steel, trimmed with raised stainless edges for extra strength. Sizes: (POM-6VA-2) center shelf 6" W. x 6½" D., lower shelf 4¾" W. x 6½" D.; (POM-10VA-2 and POM-12VA-2) center shelf 10" W. x 12" D., lower shelf 7" W. x 12" D.; (POM-16VC-2 and POM-18VC-2) center shelf 16" W. x 16" D., lower shelf 12" W. x 16" D.

MANIFOLD: Mounted on top of oven. Includes quality pressure gauge and brass valve. Second valve mounted at rear.

BUILT-IN PUMP OUTLET: (On all Models except POM-6VA-2.) Enables suitable vacuum pump, such as described below, to be plugged into oven for instant service. Pump operation controlled by handy panel-mounted switch and protected by separate fuse.

WIRING: Complete, enclosed and meets N.E. Code, as amended. Three-wire line cord and plug on POM-6VA-2, POM-10VA-2, and POM-12VA-2 Terminal box on POM-16VC-2, and POM-18VC-2. All ovens proper are U.L. Listed.

MODELS WITHOUT VACUUM PUMP AND FLOOR STAND

Model Number	Inside Dimensions Inches (Cm.)		Overall Dimensions Inches (Cm.)			Maximum Watts	*Voltage 60 Hz. A.C. Single Phase	Shipping Weight Lbs. (Kg.)	Complete Price With OTP
	Dia.	Depth	W.	D.	H.				
POM-6VA-2	6 (15)	6½ (16)	14½ (36)	17 (43)	25 (63)	400	120 V.	150 (68)	$790.00
POM-10VA-2	10 (25)	12 (31)	20 (51)	25 (63)	36 (90)	1000	120 V.	215 (97)	1135.00
POM-16VC-2	16 (40)	16 (40)	24 (61)	31 (78)	40 (101)	3000	240 V.	390 (177)	2415.00

"PACKAGED" MODELS WITH PUMP AND FLOOR STAND

(Includes above Vacuum Oven, Cabinet Type Floor Stand, and quality Vacuum Pump—completely assembled and tested.)

Model Number	Inside Dimensions Inches (Cm.)		Overall Dimensions Inches (Cm.)			Maximum Watts	*Voltage 60 Hz. A.C. Single Phase	Shipping Weight Lbs. (Kg.)	Complete Price With OTP
	Dia.	Depth	W.	D.	H.				
POM-12VA-2	10 (25)	12 (31)	20 (51)	24 (61)	66 (167)	1800	120 V.	350 (159)	$1710.00
POM-18VC-2	16 (40)	16 (40)	24 (61)	31 (78)	73 (185)	4000	240 V.	550 (249)	3185.00

*Units Available for 240 V and 208 V./1 Ph. We will supply a separate autoformer package complete with line cord and plug. Simple installation

For Model POM-6VA-2
Specify Part No. E17E-1-1 — $90.00 Each

For Model POM-10VA-2 and POM-12 VA-2
Specify Part No. E17E-1-2 — $120.00 Each

For Model POM-16VC-2 and POM-18VC-2 (208V operation)
Specify Part No. E17E-1-4 — $140.00 Each

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories

VACUUM PUMP: Quality built two-stage unit with ample capacity to produce oven vacuum rating of 50 microns or less. Toggle switch turns pump on and off. Complete with line cord and plug which plugs into female receptacle on Models POM-10VA-2 and POM-16VC-2.

(POM-6VA-2 and POM-10VA-2)
Part No. E12A-1, 120 V./1 Ph./60 Hz. A.C... $445.00 Each

(POM-16VC-2)
Part No. E12A-3, 240 V./1 Ph./60 Hz. A.C... $655.00 Each

CABINET TYPE FLOOR STAND: Heavy steel construction, finished in attractive durable blue enamel. Matches unit proper. Has auxiliary shelf and door. 20" W. x 16" D. x 30" H. on two smaller models, 24" W. x 20" D. x 33" H. on large. Designed also to accommodate vacuum pumps listed at factory or later as required

Cat. No. FS-147 (POM-6VA-2 and POM-10VA-2)...$126.00
Cat. No. FS-151A (POM-16VC-2) $170.00

EXTRA THERMOCOUPLE: As described above.
Part No. C11B-1-4 .....$25.00

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly

BLUE M

STABIL-THERM®

Economy

VACUUM OVENS

TEMPERATURE RANGE
10°C. above ambient to +160°C. (+320°F.)

VACUUM RATING
29½ inches of mercury with suitable vacuum pump

AUTOMATIC TRIGGER CONTROL
U.L. Listed . . . Sensitive response: ±0.5°C.
Enclosed Silver Contacts

STAINLESS STEEL WORK CHAMBER
One piece, deep drawn, seamless.

TEMPERED GLASS DOOR
Excellent visibility—plus safety

MEMORY RING® TEMPERATURE CALIBRATING DIAL

GOOD PERFORMANCE, ADVANCED DESIGN WITH MAXIMUM ECONOMY

This economical Blue M Vacuum Oven is the ideal choice for laboratories and schools looking for good vacuum performance at a very modest price. It also enables those who need a vacuum facility only occasionally to purchase a dependable oven without a major capital expenditure. Please note that its temperature range to +160°C. is at least 10°C. higher than competitive equipment—a clear indication of Blue M's overall superiority.

Features include quality enameled steel housing, **one-piece seamless stainless steel work chamber,** Fiberglas insulation, heat-treated glass door in sturdy metal frame, quality-built vacuum gauge, and two stainless steel shelves. The U.L. Listed Automatic Trigger Control working in conjunction with the long-lived low watt density heating element assures good performance. As these and the many other design and construction features described on the opposite page indicate, this Blue M unit is easily the best buy in the budget-priced vacuum oven field.

Please note that even though this oven is very competitively priced, it incorporates engineering concepts which Blue M has developed and proven in decades of chamber design and manufacturing experience. This invaluable expertise cannot be found in any competitive unit, regardless of price.

This oven is one of several different types of vacuum chambers available from Blue M. They vary in configuration, size and temperature range as well as in control instrumentation. Please see the Index of this catalog for their page location.

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM
WARRANTY
BLUE M
SEE PAGE 16

BLUE M

GENERAL SPECIFICATIONS AND PRICES

CONSTRUCTION: Interior deep drawn one-piece stainless steel, seamless to minimize leakage and vacuum loss. Exterior is quality-built steel with attractive FORMICA white baked-on enamel finish.

INSULATION: 2½ in. thick Fiberglas blankets all areas. Moisture-proof; will not settle or deteriorate with age.

DOOR: Tempered glass ⅝ in. thick, provides full visibility of chamber interior. Mounted in sturdy metal frame. Silicone gasket for tight seal. Positive screw-type latch, adjustable continuous hinge.

HEATING ELEMENT: Low-watt density. Installed outside vacuum chamber for maximum heating efficiency. Designed for long life.

AUTOMATIC TRIGGER CONTROL: A sensitive hydraulic thermostat mounted in front of base panel. Large silver contacts. Liquid filled system far superior to ordinary bi-metal types often used. Listed by U.L. and CSA. Features patented Memory Ring Temperature Calibrating Dial.

NEON PILOT LAMPS (2): Red, denotes unit operation, amber shows control operation. On-off switch has ample capacity to place into immediate operation.

THERMOMETER: Quality mercury-in-glass type. 0°C. to +260°C. scale, 2° C. graduations.

SHELVES (2): Solid stainless steel, removable. Center shelf 8⅞" W. x 10½" D, lower shelf 6½" W. x 10½" D.

MANIFOLD: Mounted at top of oven. Includes two specially designed adjustable valves and quality 0-30" vacuum gauge.

WIRING: Complete, enclosed and meets N.E. Code, as amended. Three-wire line cord and plug provided.

Model Number	Inside Dimensions Inches (Cm.)		Overall Dimensions Inches (Cm.)			Total KVA	*Voltage 60 Hz. A.C. Single Phase	Shipping Weight Lbs. (Kg.)	Complete Price
	Dia.	Depth	W.	D.	H.				
SV-57A	9 (22)	10½ (26)	14¼ (35)	16 (40)	26 (65)	725	120 V.	50 (22)	$395.00

*Units available for 240 V. and 208 V./1 Ph. We will supply a separate autoformer package complete with line cord and plug. Simple installation.
Specify Part No. E17E-1-1 ..... $90.00 Each

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories

VACUUM PUMP: Quality built two-stage unit with ample capacity to produce indicated oven vacuum rating. Complete with line cord and plug.
Specify Part No. E12A-1 ..... $445.00 Each

EXTRA THERMOMETER: As described above.
Specify Cat. No. C01C-3 ..... $10.00 Each

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly

BLUE M

STABIL-THERM®

ASTM ASPHALT DRYING OVEN

Rotating Shelf-Gravity Convection

with

POWER-O-MATIC 70®
PATENTED

solid-state proportioning control system and built-in overtemperature protection

TEMPERATURE RANGE:
+40°C. to +260°C. (+500°F.)

TEMPERATURE CONTROL TOLERANCE:
±0.5°C.

TEMPERATURE STABILITY: ±0.9°C.

BUILT-IN OVERTEMPERATURE PROTECTION

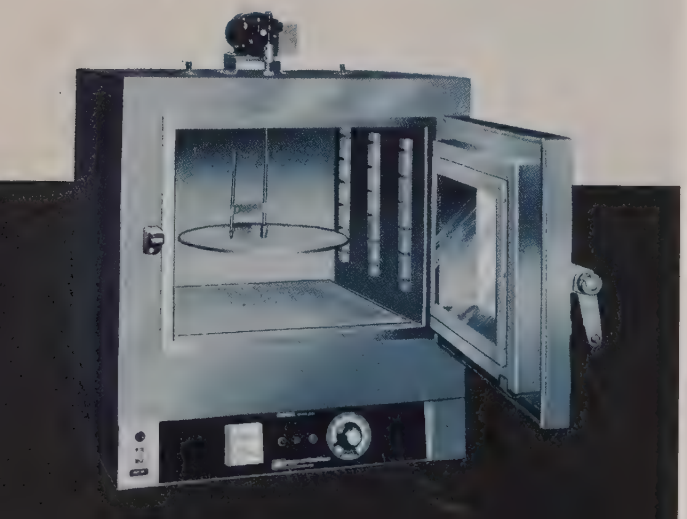
SINGLE ALL-SPEC MODEL
Meets ASTM D6 and D1754; AASHO T47 and T179

BUILT-IN AMBIENT TEMPERATURE COMPENSATION
Chamber temperature remains constant (±0.2°C.) though ambient varied ±5°C.

BUILT-IN LINE VOLTAGE COMPENSATION
Chamber temperature remains constant (±0.2°C.) with a voltage change ±7 V. on 120V.

BUILT-IN RFI SUPPRESSION
Over 90% of Radio Frequency Interference eliminated.

MEMORY RING® TEMPERATURE CALIBRATING DIAL



NOW . . . A SINGLE UNIT TO MEET ALL PERTINENT ASTM AND AASHO SPECS!

VERSATILE AND DEPENDABLE: While these ovens can be used for various purposes, they are designed specifically to meet the ASTM and AASHO designations shown at left. By removing the rotating shelf and extended shaft, the units become versatile utility ovens for analytical laboratory and general chemical work. Stainless interior construction offers excellent resistance to corrosion. The recessed control panel protects control components from damage due to spillage or accidental bumping. The ovens proper are listed by Underwriters' Laboratories, Inc.

ISOLATED MOTOR AND REDUCTION GEAR DRIVE SYSTEM: The rotating shelf motor and reduction gear drive system are isolated from the chamber temperatures for cool, long life-time, non-vibrating operation with no repairs or servicing required. Ball bearing motor and gear reducer require no periodic lubrication or attention of any kind.

RUGGED DRIVE COMPONENTS: A glance shows that the drive components are rugged and not of the enclosed gear, clock motor type that needs frequent servicing and replacement.

Blue M's Direct Line Overtemperature Protection, now standard, protects the oven and its workload against an excessive temperature rise.

SOLID-STATE PROPORTIONAL CONTROL SYSTEM MATCHED TO A CHAMBER OF PROVEN DESIGN FOR UNRIVALED PERFORMANCE AND ECONOMY

POWER-O-MATIC 70 Control System puts the miracle of modern electronic technology to work to provide truly proportional, straight line performance at a highly competitive price. Extremely compact and simple, POWER-O-MATIC 70 consists of a temperature sensitive resistance network exercising phase control on two SCRs. Voltage is controlled by a Zener Diode.

In operation, POWER-O-MATIC 70 provides a control tolerance of ±0.5°C. with extermely fast response to temperature change. The response of the temperature sensor is measured in milliseconds. Overall performance is such as you might expect from temperature regulating instrumentation costing hundreds of dollars more. Now, thanks to this advanced control system, you can purchase a chamber which meets today's needs with the assurance that it can also be used for more critical work should the need arise in the future. (See Pages 12 and 13 for full details on the POWER-O-MATIC 70 Control System.)

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

BLUE M

GENERAL SPECIFICATIONS AND PRICES

CONSTRUCTION: Double wall type. Polished 18-8 stainless, type 304 interior. Cold rolled steel exterior, durable FORMICA white baked-on enamel finish, stainless steel face of oven to match door seal.

INSULATION: All six sides insulated with a minimum 3½ in. thick blanket of Fiberglas.

DUAL ETERNA HEATING ELEMENTS: Heavy, helically coiled nickel-chromium resistance wire, which will actually withstand +2150°F., is spread over entire base of inside chamber. Positive temperature uniformity assured. Elements supported by means of grooved, ceramic refractories forming a rectangular frame, with liberal air space between each pass. Refractories used have a high dielectric strength, are impervious to moisture and common acids, and can stand temperatures of +2600°F.

INTAKE PORTS: At bottom, allow fresh air to enter for setting up proper air-flow patterns.

EXHAUST PORTS (2): At top, to provide control for fume and vapor escapement.

NEON PILOT LAMP: Red denotes oven operation.

VOLTMETER: Indicates voltage impressed across heating elements.

DOOR: Double wall type, Fiberglas insulated. Chrome-plated hinges. Chrome-plated no-slam cam action latch. Heavy silicone tubular gasket around door perimeter for positive seal. Door hinges on right side. Finished in light blue enamel for modern contrast.

OVERTEMPERATURE PROTECTION: Safeguards workloads and equipment.

OBSERVATION WINDOW: Large viewing area, 12¾ in. wide x 9¼ in. high. Permits observation of thermometer and materials during rotary shelf operation. Door has two pieces of heavy tempered glass with dead air space equivalent of door thickness between them.

SHELVES: Cast aluminum rotating shelf finished in baked-on white enamel, 13½ in. diameter. Allows 6 or more samples to be tested at a time. Shelf and drive shaft readily removed to permit oven to be used for general utility service with flat shelves. Two nickel-plated steel shelves supplied, adjustable to six positions.

SPEED OF ROTATION: A quality ball bearing motor of ample horsepower combined with lifetime sealed gear reducer to drive rotating shelf 6 RPM as per ASTM requirements.

THERMOMETERS: Standard Equipment.
1—ASTM 13C loss on heat (+155°C. to +170°C.) mounted upon and rotating with rugged shelf support shaft. Two sets of thermometer mounting brackets supplied to comply with required locations specified in test procedures.

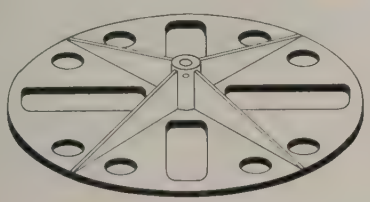
1—Standard mercury thermometer for insertion through top of oven when using standard shelves and as a utility oven. Graduated in 2°C. steps. 0°C. to +300°C. range.

WIRING: All wiring complete and enclosed. Terminal box.

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	*Voltage 60 Hz. A.C. Single Phase	Total VA	Cubic Feet Capacity	Shipping Weight Lbs. (Kg.)	Construction	Complete Price With OTP
RS-18A-2	19 (48)	18 (45)	15 (38)	27 (68)	26 (65)	39 (98)	120 V.	1970	3.0	270 (122)	Stainless Interior Enameled Steel Exterior	$1220.00

*Unit available for 240 V. and 208 V /1 Ph. We will supply a separate autoformer package complete with line cord and plug. Simple installation.

Specify Part No E17E-1-2 $120.00 Each



Drawing of typical rotating shelf supplied with this oven. Allows six or more samples to be tested at a time. Shelf and drive shaft are readily removed so that oven can be used with the two adjustable nickel-plated flat shelves furnished for more general utility service

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories

Model Number	Cabinet Type Floor Stand Heavy steel construction, with auxiliary shelf and door. Chrome-plated latch. Attractive blue enamel to complement chamber.	Extra Shelves (As described above)		Extra Thermometers (As described above)	
RS-18A-2	27" W. x 22" D. x 33" H. Cat. No. FS-186 Price Each: $110.00	Cast Aluminum Part No. MO4-E102 Price Each: $38.00	Nickel-Plated Steel Part No. MO4-A204 Price Each: $14.50	Loss of Heat Part No CO1C-9 Price Each $21.00	Testing Part No CO1C-5 $13.00 Each

Shipping weights shown are for standard models Units ordered with accessories may require special packing, increasing shipping weight slightly

BLUE M

STABIL-THERM®

COMBINATION DELUXE GRAVITY OVENS AND DRY AIR STERILIZERS

with

POWER-O-MATIC 70® PATENTED

solid-state proportioning control system and built-in overtemperature protection

TEMPERATURE RANGE
+20°C. above ambient to +300°C. (+572°F.)

TEMPERATURE CONTROL TOLERANCE: ±0.5°C.

TEMPERATURE STABILITY: ±0.9°C.

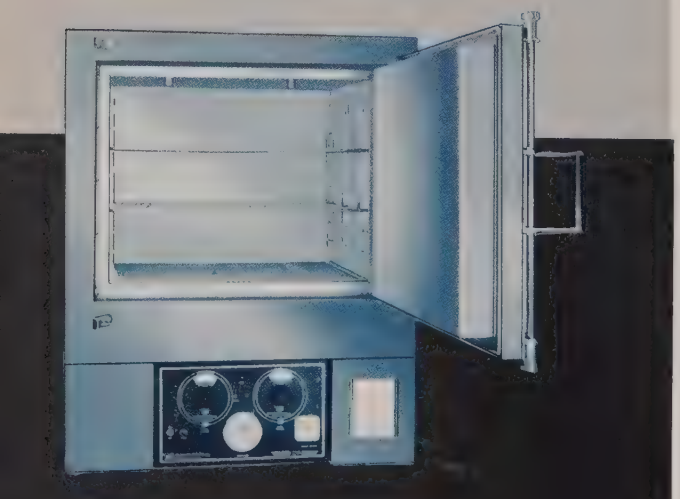
BUILT-IN AMBIENT TEMPERATURE COMPENSATION
Chamber temperature remains constant (±0.2°C.) though ambient varied ±5°C.

BUILT-IN LINE VOLTAGE COMPENSATION
Chamber temperature remains constant (±0.2°C) with a voltage change ±7 V. on 120 V.; ±15 V. on 240 V.

BUILT-IN RFI SUPPRESSION
Over 90% of Radio Frequency Interference eliminated.

BUILT-IN OVERTEMPERATURE PROTECTION
Positive safeguard for equipment and workload—at no added cost!

MEMORY RING® TEMPERATURE CALIBRATING DIAL AND DIAL POINTER LOCK
Dual scale in °C. and °F.



NEW VERSATILITY! REALLY TWO CHAMBERS IN ONE! ALL MODELS NOW U.L. LISTED!

Constructed to Army-Navy and Veterans Administration specifications, and now U.L. Listed, these STABIL-THERM DELUXE, gravity convection chambers combine extra features to give unexcelled performance and long life. POWER-O-MATIC 70 Control System assures performance never before possible with these units. Ideal for general laboratory work with the capability for more exacting work built-in. Designed to handle the most exacting dry air sterilization procedures. Highly efficient units at a highly competitive price.

Only the finest materials and workmanship go into this series of outstanding Blue M Chambers.

SOLID-STATE PROPORTIONAL CONTROL SYSTEM MATCHED TO A CHAMBER OF PROVEN DESIGN FOR UNRIVALED PERFORMANCE AND ECONOMY

POWER-O-MATIC 70 Control System puts the miracle of modern electronic technology to work to provide truly proportional straight line performance at a highly competitive price. Extremely compact and simple, POWER-O-MATIC 70 consists of a temperature sensitive resistance network exercising phase control on two SCRs. Voltage is controlled by a Zener Diode.

In operation, POWER-O-MATIC 70 provides a control tolerance of ±0.5°C. with extremely fast response to temperature change. The response of the temperature sensor is measured in milliseconds. Overall performance is such as you might expect from temperature regulating instrumentation costing hundreds of dollars more. Now, thanks to this advanced control system, you can purchase a chamber which meets today's needs with the assurance that it can also be used for more critical work should the need arise in the future. (See Pages 12 and 13 for full details on the POWER-O-MATIC 70 Control System.)

NOTE: For Deluxe Ovens Equipped With POWER-O-MATIC 60® SATURABLE REACTOR PROPORTIONING CONTROL SYSTEM, +343°C., and mechanical convection Glassware Drying and Dry Air Sterilizers, Refer to Catalog Index.

UL®
Guide No. 165E9
File No. E30112

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM
WARRANTY
SEE PAGE 16

BLUE M

GENERAL SPECIFICATIONS AND PRICES

CONSTRUCTION: DL-100, 110, 120 and 130 series are polished 18-8 stainless, type 304, inside and out . . . long wearing utility and beauty, plus maximum resistance to corrosion. DL-102, 112, 122, and 132 series have stainless interiors and heavy gauge steel exteriors finished in attractive FORMICA white enamel. All models double wall.

INSULATION: All six sides insulated with Fiberglas compressed to 3½ in. thick. Fireproof, non-hygroscopic, will not settle or deteriorate with age.

ETERNA DUAL HEATERS: Heavy helically coiled nickel-chromium resistance wire over entire width of interior assures temperature uniformity throughout chamber. Withstands +2150°F. Supported by grooved refractories on rectangular framing. Have extremely high dielectric strength, will not warp, are impervious to moisture or common acids, and withstand +2600°F.

BUILT-IN DIRECT LINE OVERTEMPERATURE PROTECTION: Automatically shuts down unit in the event of control failure. Prevents excessive temperature rise and resulting damage to equipment and workload. Completely separate from control circuit.

NOTE HOLDER: Metal, provides convenient place to keep records of unit performance, tests run, etc.

DOOR AND HARDWARE: Double wall. Exclusive adjustable no-slam, cam action latch and new chrome-plated hinges maintain positive air-tight seal. Silicone rubber seal. Door finished in light blue enamel for modern contrast.

SHELVES (2): Wire rod type polished stainless reinforced. Adjustable in 2 in. steps . . . can be partially removed without spilling contents.

NEON PILOT LAMP: Red, denotes unit operation.

INTAKE PORTS AND EXHAUST VENTS: Scientifically placed intake ports facilitate natural air currents inside chamber. Double vents at top for exhaust. Adjustable stainless covers.

READY-READ TEMPERATURE INDICATOR: 3½" diameter —for easier, more efficient operation. Dual scale in degrees C. and F.

WIRING: All wiring complete and totally enclosed. Meets N.E. Code, as amended. Terminal outlet box. U.L. Listed.

ALL STAINLESS STEEL MODELS

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Total VA	*Voltage 50/60 Hz. A.C. Single Phase	Cubic Feet Capacity	Shipping Weight Lbs. (Kg.)	Complete Price With OTP
DL-100A-2	14	14	14	22	25	35	1500	120 V.	1.6	230	$690.00
DL-100C-2	(35)	(35)	(35)	(55)	(63)	(88)	1500	**240 V.		(104)	690.00
DL-110A-2	20	15	20	28	26	41	2000	120 V.	3.5	310	920.00
DL-110C-2	(51)	(38)	(51)	(70)	(65)	(103)	2000	**240 V.		(141)	920.00
DL-120C-2	25	20	20	33	31	41	2750	**240 V	5.8	390	1105.00
	(63)	(51)	(51)	(84)	(78)	(103)				(177)	
*DL-130C-2	37	20	25	45	31	46	3750	**240 V.	10.2	500	1670.00
	(93)	(51)	(63)	(113)	(78)	(116)				(227)	

ENAMELED STEEL EXTERIOR MODELS

DL-102A-2	14	14	14	22	25	35	1500	120 V	1.6	230	$525.00
DL-102C-2	(35)	(35)	(35)	(55)	(63)	(88)	1500	**240 V.		(104)	525.00
DL-112A-2	20	15	20	28	26	41	2000	120 V.	3 5	310	730.00
DL-112C-2	(51)	(38)	(51)	(70)	(65)	(103)	2000	**240 V.		(141)	730.00
DL-122C-2	25	20	20	33	31	41	2750	**240 V.	5.8	390	880.00
	(63)	(51)	(51)	(84)	(78)	(103)				(177)	
*DL-132C-2	37	20	25	45	31	46	3750	**240 V.	10.2	500	1355.00
	(93)	(51)	(63)	(113)	(78)	(116)				(227)	

*Has two doors but no center mullion

NOTE: 240 V./1 Ph. units may be connected to two wires of a three phase line

**These models will operate reliably when connected to 208 volt service. A 25% reduction in element power will result.

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no. and voltage when ordering accessories

Series Number	Extra Shelves All Stainless Steel Part Number	Price Each	Lead-in Port and Cover, 3" Dia. For All Models	†Program Timer to Control Operating Periods	Double Glass Observation Panels Clear tempered glass, built-in located in center of door with stainless steel opening and framing. For delivery with unit only. Catalog Number	Viewing Area	Installed Per Door	*Cabinet Type Floor Stand Heavy steel construction with auxiliary shelf and door(s) Attractive blue enamel. Catalog Number	Price Each
DL-100 DL-102	MO4-A103	$25.00	Centered in Back Wall Cat. No. POR-100C $45.00	24-Hour Part No. C12A-1 $65.00 7-Day Part No. C12A-3 $85.00 Installed	GPA-100	6½" W x 8" H	$75.00	FS-142	$100.00
DL-110 DL-112	MO4-A102	34.00			GPA-101	9¼" W. x 12¾" H.	95.00	FS-143	110.00
DL-120 DL-122	MO4-A101	48.00			GPA-101X	12¾" W. x 9¼" H.	95.00	FS-144	115.00
DL-130 DL-132	MO4-A113	79.00			GPA-102	11½" W. x 16¼" H.	110.00	FS-145	145.00

*Overall height varies, cabinet designed to provide height of 40 inches from floor level to bottom of chamber

†NOTE For field installation of above timers on 240 V. units. Specify Autoformer Part No. E17A-2-1. $14.00 Each

BLUE M

STABIL-THERM®

Mechanical Convection Horizontal Air-Flow GLASSWARE DRYING AND DRY AIR STERILIZERS *with*

POWER-O-MATIC 70®
PATENTED

solid-state proportioning control system and built-in overtemperature protection

TEMPERATURE RANGE:
+40°C. to +204°C. (+400°F.)

TEMPERATURE CONTROL TOLERANCE: ±0.5°C.

TEMPERATURE STABILITY: ±1.0°C.

BUILT-IN AMBIENT TEMPERATURE COMPENSATION
Chamber temperature remains constant though temperature varied ±5°C.

BUILT-IN LINE VOLTAGE COMPENSATION
Chamber temperature remains constant with a voltage change ±15 V. on 240 V.

BUILT-IN RFI SUPPRESSION
Over 90% of Radio Frequency Interference eliminated.

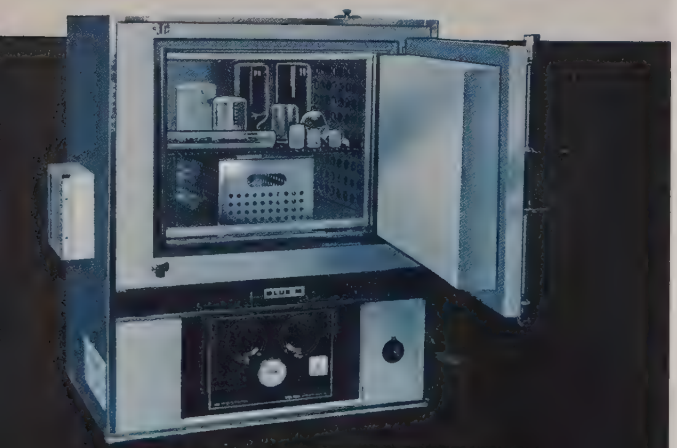
BUILT-IN OVERTEMPERATURE PROTECTION
Positive safeguard for equipment and workload—at no added cost!

FINELY ADJUSTABLE AIR INTAKE WITH QUALITY REUSABLE FILTER. LARGE EXHAUST

6-HOUR TIMER—ADJUSTABLE
To control drying and sterilizing time.

FORMICA WHITE BAKED-ON ENAMEL EXTERIOR

MEMORY RING® TEMPERATURE CALIBRATING DIAL AND DIAL POINTER LOCK
Dual scale in °C. and °F.



Unit illustrated with typical glassware not supplied and with optional stainless steel glassware basket.

CUSTOM-ENGINEERED CABINETS FOR CRITICAL WORK REQUIRING SUPER-FAST DRYING—5 TO 12 MINUTES

These new Blue M Glassware Drying and Dry Air Sterilizers have been especially engineered to provide hospitals and laboratories with a reliable means to dry/sterilize at high speeds. A special finely adjustable air-flow system enables the operator to manually adjust the passage of filtered air over and around the workload to obtain drying speeds which far surpass conventional gravity or standard mechanical convection type cabinets. High powered Blue M Eterna Heaters, coupled with the straight-line temperature performances of the patented POWER-O-MATIC 70 Control, assures an operational capability of fast drying and temperature stability. A built in six-hour timer permits control of heating and cooling periods as desired when prescribed time period has elapsed, heaters are turned off but powerful blower system continues to operate for faster cooling. Built-in overtemperature protection safeguards cabinet and workload.

The control panel and practically all control components are mounted on a special sliding drawer. The operator simply loosens four fasteners at the panel corners, and pulls the entire assembly forward for complete access to any part that may require inspection. Other quality features include all-stainless interiors designed for full loading, rugged all-welded construction, heavy insulation, and an attractive FORMICA white baked-on enamel finish to complement any laboratory. If you have a critical drying and/or sterilization application, these fine Blue M cabinets are the logical units to consider.

SOLID-STATE PROPORTIONAL CONTROL SYSTEM MATCHED TO A CHAMBER OF PROVEN DESIGN FOR UNRIVALED PERFORMANCE AND ECONOMY

POWER-O-MATIC 70 Control System puts the miracle of modern electronic technology to work to provide truly proportional straight line performance at a highly competitive price. Extremely compact and simple, POWER-O-MATIC 70 consists of a temperature sensitive resistance network exercising phase control on two SCRs. Voltage is controlled by a Zener Diode.

In operation, POWER-O-MATIC 70 provides a control tolerance of ±0.2°C. with extremely fast response to temperature change. The response of the temperature sensor is measured in milliseconds. Overall performance is such as you might expect from temperature regulating instrumentation costing hundreds of dollars more. Now, thanks to this advanced control system, you can purchase a chamber which meets today's needs with the assurance that it can also be used for more critical work should the need arise in the future.

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM
WARRANTY
BLUE M
SEE PAGE 16

BLUE M

SEE PAGES 12-13 FOR FULL DESCRIPTION OF PATENTED POWER-O-MATIC 70 CONTROL SYSTEM

GENERAL SPECIFICATIONS AND PRICES

INTERIOR: All models and inside of door(s) type 304, 18-8 stainless steel . . . excellent resistance to heat and corrosion. Bottom is free of any supplementary obstructions. Glassware can be placed as desired.

EXTERIOR: Heavy gauge cold rolled steel; reinforced with minimum through bracing . . . all welded construction for ruggedness. Attractive, durable FORMICA white baked-on enamel finish. Note: Exterior and interior chambers employ specially designed barriers to minimize heat conduction between joining faces.

DOOR AND HARDWARE: Double wall. Exclusive adjustable no-slam, cam action latch and chrome-plated hinges. Double silicone rubber seals plus stainless steel spring heat barriers around entire door perimeter.

INSULATION: Minimum 4 in. thick blanket of non-hygroscopic, fire-proof, Fiberglas wool; will not settle.

FINELY ADJUSTABLE AIR-FLOW SYSTEM: Tempered air passes over heaters and through chamber exhaust as required. Greatly speeds drying. System includes intake fitted with an alloy reusable filter which prevents impurities from entering chamber. Simple manual adjustment regulates air-flow as required. Quality ball bearing motor and multi-bladed blower designed to assure long service at elevated temperatures.

BUILT-IN TIMER: 6-Hour, for regulation of heating and cooling periods.

ETERNA HEATER BANKS: Black-Heat; "Controlled" low watt density. Shielded. No radiant heat. Assure years of service. High powered K.W. rating provides fast temperature run-up even with heavy loads.

BUILT-IN DIRECT LINE OVERTEMPERATURE PROTECTION: Automatically shuts down unit in the event of control failure. Prevents excessive temperature rise and resulting damage to equipment and workload. Completely separate from control circuit.

SHELF: Wire rod type stainless steel, electropolished. Stainless non-tilting type brackets for shelf adjustment on 2" centers. OPTIONAL: Stainless steel baskets. See ACCESSORIES Below.

VOLTMETER: Power input indication.

NEON PILOT LAMP: Red; denotes unit operation.

READY-READ TEMPERATURE INDICATOR: 3½" diameter—for easier, more efficient operation. Dual scale in degrees C. and F.

WIRING: Complete, totally enclosed. Terminal box provided. Simply connect to power line. Meets N.E. Code as amended.

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Total KVA	*Voltage 60 Hz. A.C. Single Phase	Cubic Feet Capacity	Shipping Weight Lbs. (Kg.)	Complete Price With OTP
POM-2706C-3	20 (51)	18 (45)	20 (51)	41 (103)	30 (76)	49 (123)	4.5	240 V.	4 1	400 (181)	$1195.00
POM-2806C-3	25 (63)	20 (51)	20 (51)	46 (116)	32 (80)	49 (123)	6.8	240 V.	5.8	520 (236)	1425.00

*These units will operate reliably when connected to 208 Volt service. A 25% reduction in element power will result

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories

EXTRA SHELVES: As described above.
POM-2706C-3: Part No. MO4-A116 ..... $47.00 Each
POM-2806C-3: Part No. MO4-A117 ..... 56.00 Each

STAINLESS STEEL GLASSWARE BASKETS: Heavy gauge, perforated, and electropolished. Dimensions: 12" wide x 8" deep x 18" long.

Model POM-2706C will accommodate (2) using shelf.

Model POM-2806C will accommodate (4) using shelf.

Part No. M20-A5 ..... $64.00 Each

CABINET TYPE FLOOR STAND: Heavy steel construction with auxiliary shelf and door. Elevates unit approximately 21". Attractive blue enamel.
Model POM-2706C-3: Part No. FS-192 ..... $110.00 Each
Model POM-2806C-3: Part No. FS-193 ..... $125.00 Each

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly

BLUE M

STABIL-THERM®

Dry Type Constant Temperature *gravity convection* BACTERIOLOGICAL INCUBATORS *with*

POWER-O-MATIC 70® PATENTED

solid-state proportioning control system

TEMPERATURE RANGE:
2°C. above ambient to +65°C. (+149°F.)

TEMPERATURE CONTROL TOLERANCE: ±0.5°C.

TEMPERATURE STABILITY: ±0.9°C.

BUILT-IN AMBIENT TEMPERATURE COMPENSATION
Chamber temperature remains constant (±0.2°C.) though ambient varied ±5°C.

FORMICA WHITE BAKED-ON ENAMEL EXTERIOR

BUILT-IN LINE VOLTAGE COMPENSATION
Chamber temperature remains constant (±0.2°C.) with a voltage change ±7 V. on 120 V.

BUILT-IN RFI SUPPRESSION
Over 90% of Radio Frequency Interference eliminated.

MEMORY RING® TEMPERATURE CALIBRATING DIAL AND DIAL POINTER LOCK

TEMPERED GLASS INNER DOOR (S)

Model POM-200A-2

Model POM-300A-2

RELIABILITY, PERFORMANCE AND TRUE ECONOMY . . . EQUIPPED WITH OUR OWN SOLID-STATE PROPORTIONING CONTROL FOR OPERATIONAL EFFICIENCY AND EASE YOU HAVE TO EXPERIENCE TO BELIEVE!

THE FINEST GRAVITY INCUBATOR WE'VE EVER BUILT AT THIS LOW PRICE! IDEAL FOR . . . INCUBATION AT +37°C—INACTIVATION AT +56°C. —PARAFFIN EMBEDDING AT +30°C. TO +65°C.

These outstanding Blue M Bacteriological Incubators meet the growing need of laboratories for economical units with excellent control. They are designed for use in conjunction with drying and staining of slides, tissue culture work, incubation of antibody tests, curing, pharmaceutical stability tests, micro-biological determinations, crystallization studies, incubation of hydroxy-steroids, and similar work. They easily meet the most strict demands of hospitals, medical schools, research laboratories, military and public health centers and other organizations requiring efficient dry heat incubation or paraffin embedding within their temperature range.

The cabinets proper—including the all-new large size designed for volume processing—incorporate design and construction features which have been tested and proven in actual service for a number of years. The inner glass doors, for example, allow full inspection of cabinet interior without disturbing temperature stability. And because current consumption is minimal, these Incubators can be operated continuously. POWER-O-MATIC 70 Control provides true straight-line performance with operating characteristics customarily associated only with cabinets costing much more. The result is a series of outstanding incubators at a price within even modest budgets.

This is just one example of Blue M's complete line of Incubators and Sterilizers. Please see Index for page numbers of others.

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY BLUE M

SEE PAGE 16

BLUE M

SEE PAGES 12 AND 13 FOR FULL DESCRIPTION OF PATENTED POWER-O-MATIC 70 CONTROL SYSTEM.

GENERAL SPECIFICATIONS AND PRICES

CONSTRUCTION: Double wall housing and door of heavy gauge steel, inside and out; reinforced, spot welded, and double hemmed for rugged, long lasting wear. Interior finish is a beautiful baked-on white enamel; exterior finished in attractive and durable, baked-on FORMICA white enamel.

INSULATION: Fiberglas wool, 2 in. thick blankets on all sides. This insulation material is ideal since it is fireproof, moisture-proof and will not settle or deteriorate with age. Perfect thermal equilibrium.

SHELVES (2): Wire rod type with a bright nickel-plated finish. Model POM-200A-2 shelves are adjustable to eleven positions, Model POM-300-A-2 shelves are adjustable to ten positions.

VENTING: Double fresh air vents at bottom of oven provide necessary heat distribution air-flow pattern. At top of incubator are two adjustable and controlled exhaust vents.

ETERNA HEATER BANK: These superior elements are designed to give thorough uniformity. Helically coiled nickel-chromium elements are supported by means of grooved, ceramic refractories forming a rectangular frame, with liberal air space between each pass. Refractories used have extremely high dielectric strength, will not warp, are impervious to moisture and common acids. Elements easily replaceable, if ever necessary.

INNER GLASS DOOR(S): Clear, unobstructed view of full working chamber. Hinged to open 90° to permit removal of shelves. Extruded aluminum frame. Gasketed, air-tight. Model POM-300A-2 has double doors. Tempered glass.

OUTER DOOR(S): Double wall construction; insulated with Fiberglas wool. No-slam cam-action latch and chromeplated hinges. Model POM-300A-2 has double doors.

VOLTMETER: Power input indication.

THERMOMETER: Glass thermometer, graduated in ½°C. steps, and with a 0°C. to +70°C. range is furnished. Red markings indicate +37°C. and +56°C.

WIRING: All wiring complete; ready for instant use. Equipped with molded 3 wire 6 foot line cord, plug and strain relief.

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	*Voltage 50/60 Hz. A.C. Single Phase	Cubic Feet Capacity	Total VA	Shipping Weight Lbs. (Kg.)	Complete Price
POM-200A-2	19 (48)	18 (45)	28 (70)	25 (63)	25 (63)	41 (103)	120 V.	5.5	225	240 (109)	$860.00
POM-300A-2	37 (93)	20 (51)	25 (63)	42 (105)	28 (70)	39 (98)	120 V.	10.0	300	320 (145)	1510.00

*Units available for 240 V. and 208 V./1 Ph. We will supply a separate autoformer package complete with line cord and plug. Simple installation.
Specify Part No. E-17E-1-1 ..... $90.00 Each

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit and model no., and voltage when ordering accessories

Model Number	Extra Shelves Wire Rod Nickel-Plated Part Number	Price Each	Cabinet Type Floor Stand Heavy steel construction, with auxiliary shelf and door. Chrome-plated latch. Attractive enamel finish to complement chamber
POM-200A-2	MO4-A204	$14.50	Cat. No. FS-186 Price Each: $105.00 Shipping Weight: 75 lbs.
POM-300A-2	MO4-A213	$49.00	Cat. No. FS-172 Price Each: $185.00 Shipping Weight: 175 lbs.

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly.

BLUE M

Budget Dry Type

gravity convection

BACTERIOLOGICAL INCUBATORS

TEMPERATURE RANGE:
5°C. above ambient to +65°C. (+149°F.)

AUTOMATIC TRIGGER CONTROL
U.L. Listed . . . Sensitive response ±0.5°C.
Enclosed silver contacts

ETERNA HEATER BANK
Black heat—Low watt density

DOUBLE WALL CONSTRUCTION
Fiberglas insulation, no-slam, cam-action latch

GLEAMING BAKED-ON WHITE ENAMEL INTERIOR AND FORMICA WHITE ENAMEL EXTERIOR
Ease in cleaning and utility

EASIER TO READ AND USE CONTROL PANEL

FULL SIZE INNER GLASS DOOR(S)
Open full 90°; Air tight gasket; Tempered glass

ECONOMICAL TO OPERATE

READY FOR INSTANT USE
All wiring complete, U.L. Listed, Canadian Standards Approved

MEMORY RING® TEMPERATURE CALIBRATING DIAL

IDEAL FOR . . . INCUBATION AT +37°C.— INACTIVATION AT +56°C.— PARAFFIN EMBEDDING AT +30°C. TO +65°C.

Performance tests prove conclusively that these Blue M Budget Incubators equal or surpass other makes higher in price. They are designed for use in conjunction with drying and staining of slides, tissue culture work, incubation of antibody tests, curing, pharmaceutical stability tests, microbiological determinations, crystallization studies, incubation of hydroxy-steroids, and similar work. They meet the requirements of hospitals, medical schools, research laboratories, military and public health centers and other organizations requiring efficient dry heat incubation or paraffin embedding within their temperature range

The "heart" of these fine units—including the all-new large size designed for volume processing—is a U.L. Listed and Canadian Standards Approved Automatic Hydraulic Trigger Control with an electric rating of 20 amperes on 120 Volt 60 Hz. A.C. Yet, electrical ratings are 120 watts (less than one ampere) for smaller model and 300 watts (less than three amperes) for larger. This minimal current consumption enables these Incubators to be operated continuously. Inner glass doors permit full inspection of interior without upsetting temperature stability. If you need a dependable dry type Incubator at a budget price, these are the cabinets to buy

This is just one example of Blue M's complete line of Incubators and Sterilizers. Please see Index for page numbers of others.

Guide No. 165E9
File No. E30112

File No. LR26058-1

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY BLUE M

SEE PAGE 16

BLUE M

GENERAL SPECIFICATIONS AND PRICES

CONSTRUCTION: Double wall housing and door of heavy gauge steel, inside and out; reinforced, spot welded, and double hemmed for rugged, long lasting wear. Interior finish is a beautiful baked-on white enamel; exterior finished in attractive and durable FORMICA white enamel.

INSULATION: Fiberglas wool, 2 in. thick blankets on all sides. This insulation material is ideal since it is fireproof, moisture-proof and will not settle or deteriorate with age. Perfect thermal equilibrium.

AUTOMATIC TRIGGER CONTROL: This hydraulic, electric thermostat maintains high degree of accuracy. Rated capacity is 20 amperes on 120 volts A.C. which means a tremendous safety factor for enclosed silver contacts. Control is U.L. Listed and Canadian Standards Approved. Memory Ring Dial assures temperature reproducibility and unmatched operating ease.

SHELVES (2): Wire rod type with a bright nickel-plated finish. Model 100A shelves are adjustable to five positions. Model 200A shelves are adjustable to eleven positions. Model 300A shelves are adjustable to ten positions.

VENTING: Double fresh air vents at bottom of oven provide necessary heat distribution air-flow pattern. At top of incubator are two adjustable and controllable exhaust vents.

ETERNA HEATER BANK: These superior elements are designed to give excellent uniformity. Helically coiled nickel-chromium elements are supported by means of grooved, ceramic refractories forming a rectangular frame, with liberal air space between each pass. Refractories used have extremely high dielectric strength, will not warp, are impervious to moisture and common acids. Elements easily replaceable, if ever necessary.

ON-OFF SWITCH AND NEON PILOT LAMPS (2): Switch is of ample capacity to place incubator into quick operation. Two neon pilot lamps provided. Red to denote incubator is operating; amber to denote Automatic Trigger Control is operating.

INNER GLASS DOOR(S): Clear, unobstructed view of full working chamber. Hinged to open 90° to permit removal of shelves. Extruded aluminum frame. Gasketed, air-tight. Model 300A only has double doors. Tempered glass.

OUTER DOOR(S): Double wall construction; insulated with Fiberglas wool. No-slam cam-action latch and chrome-plated hinges. Model 300A only has double doors.

THERMOMETER: Glass thermometer, graduated in ½°C. steps, and with a 0°C. to +70°C. range is furnished. Red markings indicate +37°C. and +56°C.

WIRING: All wiring complete; units ready for instant use. Equipped with molded 3 wire 6 foot line cord, plug and strain relief. All models are U.L. Listed and Canadian Standards Approved.

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	*Voltage 50/60 Hz. A.C. Single Phase	Cubic Feet Capacity	Maximum Watts	Shipping Weight Lbs. (Kg.)	Complete Price
100A	12 (31)	12 (31)	12 (31)	18 (45)	18 (45)	23 (58)	120 V.	1 0	120	60 (27)	$270.00
200A	19 (48)	18 (45)	28 (70)	25 (63)	25 (63)	39 (98)	120 V.	5.5	225	140 (63)	480.00
300A	37 (93)	20 (51)	25 (63)	42 (105)	28 (70)	39 (98)	120 V.	10 0	300	320 (145)	1095.00

*Units available for 240 V. and 208 V /1 Ph. We will supply a separate autoformer package complete with line cord and plug. Simple installation. Specify Part No. E-17E-1-1 ..... $90.00 Each

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories

Model Number	Extra Shelves Wire Rod Nickel-Plated Part Number	Price Each	Extra Glass Thermometer As described above (For All Models)	Cabinet Type Floor Stand* Heavy steel construction, with auxiliary shelf and door. Chrome-plated latch, Attractive enamel finish to complement chamber.
100A	MO4-A208	$10.00	Part No. CO1C-7 Price Each $10.00	For Model 200A Cat. No. FS-186 Price Each: $105.00 Shipping Weight: 75 lbs
200A	MO4-A204	14.50		
300A	MO4-A213	49.00		For Model 300A Cat. No. FS-172 Price Each: $185.00 Shipping Weight: 175 lbs

*NOTE: Floor stand not required for Model 100A

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly.

BLUE M

Dry Type
Gravity Convection
CO_2 INCUBATORS

TEMPERATURE RANGE:
2°C. above ambient to +65°C. (+149°F.)

AUTOMATIC TRIGGER CONTROL
U.L. Listed . . . Sensitive response ±0.5°C.
Enclosed silver contacts

QUALITY CO_2 CONTROL SYSTEM
Provides 0-20% CO_2 Tension

CO_2 PREHEAT COIL
Reduces temperature gradients

ETERNA HEATER BANK
Black heat—Low watt density

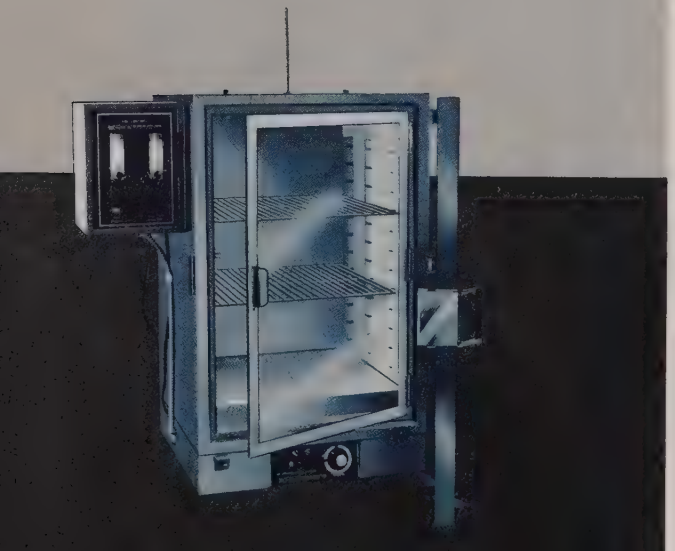
DOUBLE WALL CONSTRUCTION
Fiberglas insulation, no-slam, cam-action latch

BAKED-ON FORMICA WHITE ENAMEL EXTERIOR, BAKED-ON OFF-WHITE ENAMEL INTERIOR
Ease in cleaning and utility

FULL SIZE INNER GLASS DOOR(S)
Open full 90°; Air tight gasket; Tempered glass
Larger model has (2)—but no center mullion

MEMORY RING® TEMPERATURE CALIBRATING DIAL

READY FOR INSTANT USE
All wiring complete



QUALITY CO_2 CHAMBERS FOR GOOD PROCESSING RESULTS UNDER DRY CONDITIONS

Blue M's new Dry Type CO_2 Incubators provide laboratories with an efficient, economical method to conduct various test procedures in atmospheres with CO_2 tension as high as 20%. Designed primarily for producing optimum conditions for the accelerated growth of many CO_2-dependent bacteria, these chambers can also be used as standard dry type units for incubation at +37°C., inactivation at +56°C., and paraffin embedding at +30°C. to +65°C.

Quality features of these cabinets include a specially designed gas control system with two flow meters, one for CO_2 and one for air. Each has an accurate needle control valve which permits the regulation and maintenance of desired CO_2 tension. A differential pressure regulating device assures a constant flow of gas into the chamber even with large variations in input pressure. A push-button activated fast-purge cycle quickly brings chamber atmosphere to desired operating level. Cycle is adjustable up to two minutes. An efficient preheat coil installed directly under the heating elements preheats the CO_2 to reduce temperature gradients.

Blue M's Automatic Trigger Control—proven dependable in countless applications—coupled with the many superior design and construction features described on the opposite page, add up to a series of cabinets which will give years of service in microbiology, pathology, physiology or cytology work.

EQUIPMENT COVERED BY OUR EXCLUSIVE
PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM
WARRANTY
BLUE M
SEE PAGE 16

BLUE M

GENERAL SPECIFICATIONS AND PRICES

CONSTRUCTION: Double wall housing and door of heavy gauge steel, inside and out; reinforced, spot welded, and double hemmed for rugged, long lasting wear. Interior finish is a beautiful baked-on off-white enamel; exterior finished in attractive and durable FORMICA white enamel.

INSULATION: Compressed Fiberglas wool, 2 in. thick blankets on all sides. This insulation material is fireproof and will not settle or deteriorate with age. Perfect thermal equilibrium.

AUTOMATIC TRIGGER CONTROL: This hydraulic, electric thermostat maintains a high degree of accuracy. Rated capacity is 20 amperes on 120 volts A.C. which means a tremendous safety factor for enclosed silver contacts. Control is U.L. Listed and Canadian Standards Approved. Memory Ring Dial assures temperature reproducibility and unmatched operating ease.

SHELVES (2): Wire rod type with a bright nickel-plated finish. Shelves on smaller model are adjustable to eleven positions. Shelves on larger model are adjustable to ten positions.

ETERNA HEATER BANK: These superior elements are designed to give excellent uniformity. Helically coiled nickel-chromium elements are supported by means of grooved, ceramic refractories forming a rectangular frame, with liberal air space between each pass. Refractories used have extremely high dielectric strength, will not warp, are impervious to moisture and common acids.

ON-OFF SWITCH AND NEON PILOT LAMPS (2): Switch is of ample capacity to place incubator into quick operation. Two neon pilot lamps provided. Red to denote incubator is operating; amber to denote Automatic Trigger Control is operating.

INNER GLASS DOOR(S): Clear, unobstructed view of full working chamber. Hinged to open 90° to permit removal of shelves. Extruded aluminum frame. Gasketed, air-tight. Larger model only has double doors. Tempered glass.

OUTER DOOR(S): Double wall construction; insulated with Fiberglas wool. No-slam cam-action latch and chrome-plated hinges. Larger model only has double doors.

THERMOMETER: Glass thermometer, graduated in ½°C. steps, and with a 0°C. to +70°C. range is furnished. Red markings indicate +37°C. and +56°C.

GAS CONTROL SYSTEM: Conveniently mounted on left side of cabinet. Consists of two flow meters—one for CO_2 and one for air—each with a quality needle control valve for accurately maintaining desired CO_2 tension at from 0 to 20%. Differential pressure regulating device assures constant gas flow into chamber regardless of input pressure variations. Push-button fast purge cycle, adjustable up to two minutes, brings chamber atmosphere to desired operating level.

GAS ANALYZER PORT: For conveniently attaching any desired CO_2 atmosphere measuring instrument. Rubber stopper prevents gas leakage when analyzer is not used.

WIRING: All wiring complete; units ready for instant use. Equipped with molded 3 wire 6 foot line cord, plug and strain relief.

Model Number	Inside Dimensions Inches (Cm.)			Overall Dimensions Inches (Cm.)			*Voltage 60 Hz. A.C. Single Phase	Cubic Feet Capacity	Total VA	Shipping Weight Lbs. (Kg.)	Complete Price
	W.	D.	H.	W.	D.	H.					
CO-400A-2	19 (48)	18 (45)	28 (70)	33 (84)	25 (63)	39 (98)	120 V.	5.5	225	140 (63)	$1090.00
CO-500A-2	37 (93)	20 (51)	25 (63)	50 (127)	28 (70)	39 (98)	120 V.	10.0	300	320 (145)	1730.00

*Units available for 240 V. and 208 V./1 Ph. We will supply a separate autoformer package complete with line cord and plug. Simple installation.

Specify Part No. E17E-1-1..... $90.00 Each

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories.

Model Number	Extra Shelves Wire Rod Nickel-plated		Extra Glass Thermometer As described above (For All Models)	Cabinet Type Floor Stand Heavy steel construction, with auxiliary shelf and door. Chrome-plated latch. Attractive enamel finish to complement chamber.
	Part Number	Price Each		
CO400A-2	MO4-A204	$14.50	Part No. CO1C-7 Price Each $10.00	For Model CO-400A-2 Cat. No. FS-186 Price Each: $105.00 Shipping Weight: 75 lbs.
CO-500A-2	MO4-A213	$49.00		For Model CO-500A-2 Cat. No. FS-172 Price Each: $185.00 Shipping Weight: 175 lbs.

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly

BLUE M

STABIL-THERM®

mechanical convection

Horizontal Air-Flow

DRY TYPE INCUBATORS

with

POWER-O-MATIC 70® PATENTED

solid-state proportioning control system and built-in overtemperature protection

TEMPERATURE RANGE: +30°C. to +100°C. (+212°F.) Has built-in cooling coil for operation at or below +37°C.

TEMPERATURE CONTROL TOLERANCE: ±0.2°C.

TEMPERATURE STABILITY: ±0.4°C.

BUILT-IN AMBIENT TEMPERATURE COMPENSATION
Chamber temperature remains constant (±0.1°C.) though temperature varied ±5°C.

BUILT-IN LINE VOLTAGE COMPENSATION
Chamber temperature remains constant (±0.1°C.) with a voltage change ±7 V. on 120 V.

FORMICA WHITE BAKED-ON ENAMEL EXTERIOR

BUILT-IN RFI SUPPRESSION
Over 90% of Radio Frequency Interference eliminated.

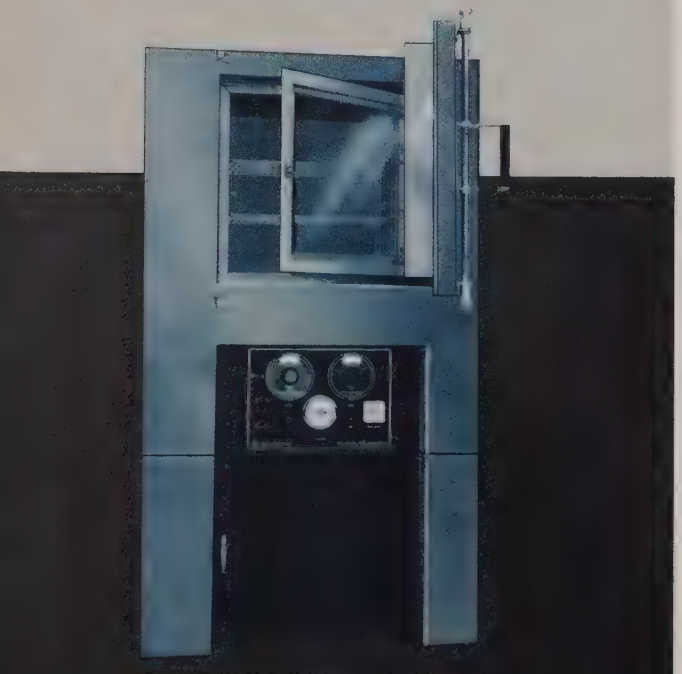
BUILT-IN OVERTEMPERATURE PROTECTION
Positive safeguard for equipment and workload—at no added cost!

INCUBATION: At +37°C.

INACTIVATION: At +56°C.

PARAFFIN EMBEDDING: +37°C. to +65°C.

MEMORY RING® TEMPERATURE CALIBRATING DIAL AND DIAL POINTER LOCK
Dual scale in °C. and °F.



SHOWN WITH OPTIONAL FLOOR STAND

INCUBATORS UNCONDITIONALLY GUARANTEED TO OUTPERFORM ALL OTHERS

These fine Blue M Dry Type Incubators are the ideal choice for laboratories requiring the superior performance available from mechanical convection. They are designed for use in conjunction with drying and staining of slides, tissue culture work, incubation and antibody tests, curing, pharmaceutical stability tests, micro-biological determinations, crystallization studies, incubation of hydroxy-steroids, and similar work. They easily meet the most strict demands of hospitals, medical schools, research laboratories, military and public health centers and other organizations requiring efficient dry heat incubation or paraffin embedding within their temperature range.

Features include inner glass doors which allow full inspection of cabinet interior without disturbing temperature stability, and minimal power consumption to permit continuous operation if necessary. Exclusive POWER-O-MATIC 70 Control provides true straight-line performance with a control tolerance of ±0.2°C. Built-in overtemperature protection safeguards workload and cabinet.

This is just one example of Blue M's complete line of Incubators and Sterilizers. Please see Index for page numbers of others.

SOLID-STATE PROPORTIONAL CONTROL SYSTEM MATCHED TO A CHAMBER OF PROVEN DESIGN FOR UNRIVALED PERFORMANCE AND ECONOMY

POWER-O-MATIC 70 Control System puts the miracle of modern electronic technology to work to provide truly proportional straight line performance at a highly competitive price. Extremely compact and simple, POWER-O-MATIC 70 consists of a temperature sensitive resistance network exercising phase control on two SCRs. Voltage is controlled by a Zener Diode.

In operation, POWER-O-MATIC 70 provides a control tolerance of ±0.2°C. with extremely fast response to temperature change. The response of the temperature sensor is measured in milliseconds. Overall performance is such as you might expect from temperature regulating instrumentation costing hundreds of dollars more. Now, thanks to this advanced control system, you can purchase a chamber which meets today's needs with the assurance that it can also be used for more critical work should the need arise in the future.

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

BLUE M

SEE PAGES 12 AND 13 FOR FULL DESCRIPTION OF PATENTED POWER-O-MATIC 70 CONTROL SYSTEM.

GENERAL SPECIFICATIONS AND PRICES

BUILT-IN DIRECT LINE OVERTEMPERATURE PROTECTION: Automatically shuts down unit in the event of control failure. Prevents excessive temperature rise and resulting damage to equipment and workload. Completely separate from control circuit.

ETERNA ELEMENTS: Black-Heat; "Controlled" low-watt density, even at maximum temperature. Reducing voltage reduces watt density. No thermal shock, no screws or welded parts, **no radiant heat;** continuous elements with external connections.

BUILT-IN COPPER COOLING COIL: Permits tap water hook-up for controlling temperatures near ambient and to overcome Joule effect of motor/blower heat input.

VOLTMETER: Power input indication.

MOTOR: Quality, all-angle heavy duty motor designed especially for blower duty. Ample horsepower to give long, trouble free service. Has exclusive Blue M vibrationless mounting design.

DEFINITE DIRECTED AIR-FLOW: Multi-bladed blower, statically balanced, circulates heated air horizontally across working chamber to produce uniform heat distribution. No need for special loading.

INTERIOR: All models and inside of door(s) type 304, 18-8 stainless steel . . . excellent resistance to heat and corrosion.

EXTERIOR: Heavy guage cold rolled steel; reinforced with minimum through bracing . . . all welded construction for ruggedness. Attractive FORMICA white baked-on enamel finish.

DOOR(S) AND HARDWARE: All models have full size, one-piece glass observation door and double wall outer door. Exclusively designed glass frame of stainless steel is of tubular construction and provides extra strength and rigidity. Outer door insulated with 4 in. Fiberglas wool. Exclusive adjustable no-slam, cam action latch and new chrome-plated hinges maintain air-tight seal. Silicone rubber seal.

INSULATION: Minimum 4 in. thick blanket of non-hygroscopic, fireproof, Fiberglas wool; will not settle.

SHELVES (2): Wire rod type reinforced, nickel-plated steel, with adjustable double-runner type shelf supports. POM-4916A-3 has tubular frame, expanded metal shelves. Adjustable on 2" centers

READY-READ TEMPERATURE INDICATOR: 3½" diameter —for easier, more efficient operation. Dual scale in degrees C. and F.

WIRING: Complete, totally enclosed. Meets N.E. Code as amended. Terminal box provided at the rear of base for all models.

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Total KVA	*Voltage 60 Hz. A.C. Single Phase	Cubic Feet Capacity	Shipping Weight Lbs. (Kg.)	Complete Price With OTP
POM-4716A-3	20 (51)	18 (45)	20 (51)	35 (88)	30 (76)	49 (123)	1.5	120 V.	4.1	500 (227)	$1295.00
POM-4816A-3	25 (63)	20 (51)	20 (51)	40 (101)	32 (80)	49 (123)	1.8	120 V.	5 8	620 (281)	1525.00
**POM-4916A-3	38 (95)	20 (51)	25 (63)	53 (133)	32 (80)	62 (157)	3.1	120 V.	10.0	850 (386)	2415.00

*Units available for 240 V. and 208 V./1 Ph. We will supply a separate autoformer package complete with line cord and plug. Simple installation.

For Model Nos. POM-4716A-3 and 4816A-3
Specify Part No. E17E-1-1..... $90.00 Each

For Model No. POM-4916A-3
Specify Part No. E17E-1-2..... $120.00 Each

**Has two doors but no center mullion

NOTE: Models POM-4716A-3 and POM-4816A-3 are bench type units. Optional matching cabinet type floor stands for these units are described below. Model POM-4916A-3 only has the floor stand as an integral part of the cabinet.

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories

EXTRA SHELVES AND BRACKETS: As described above.

POM-4716A-3: Part No. MO4-A216 ..... $27.00 Each
POM-4816A-3: Part No. MO4-A217 ..... 28.00 Each
POM-4916A-3: Part No. MO4-B202 ..... 48.00 Each

CABINET TYPE FLOOR STANDS: Heavy steel with auxiliary shelf and door. Attractive enamel finish complements chamber. Elevate units approximately 20" from floor

POM-4716A-3: Cat. No. FS-192 .....$120.00 Each
POM-4816A-3: Cat. No. FS-193 .....$135.00 Each

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly

BLUE M

STABIL-THERM®

Dry Type Constant Temperature *gravity convection* INCUBATORS *with*

POWER-O-MATIC 70®
PATENTED

solid-state proportioning control system and built-in overtemperature protection

TEMPERATURE RANGE: 5°C. above ambient to +100°C. (+212°F.)

TEMPERATURE CONTROL TOLERANCE: ±0.5°C.

TEMPERATURE STABILITY: ±0.9°C.

BUILT-IN AMBIENT TEMPERATURE COMPENSATION
Chamber temperature remains constant (±0.2°C.) though ambient varied ±5°C.

BUILT-IN LINE VOLTAGE COMPENSATION
Chamber temperature remains constant (±0.2°C) with a voltage change ±7 V. on 120 V.

BUILT-IN RFI SUPPRESSION
Over 90% of Radio Frequency Interference eliminated

BUILT-IN OVERTEMPERATURE PROTECTION
Positive safeguard for equipment and workload—at no added cost!

UNIFORMITY: At +37°C. (±1°C.)
At +56°C. (±1.5°C.)

INCUBATION: +37°C.

INACTIVATION: At +56°C.

PARAFFIN EMBEDDING: At +30°C. to +65°C.

MEMORY RING® TEMPERATURE CALIBRATING DIAL AND DIAL POINTER LOCK
Dual scale in °C. and °F.

AVAILABLE IN ALL STAINLESS STEEL OR WITH ENAMELED STEEL EXTERIOR

UNITS FOR LONG TERM STORAGE OF EXPENSIVE CULTURES OR FOR ROUTINE DRY TYPE INCUBATIONAL PROCEDURES

These are Blue M's finest Dry Type Gravity Convection Incubators. They are designed for use in conjunction with drying and staining of slides, tissue culture work, incubation of antibody tests, curing, pharmaceutical stability tests, micro-biological determinations, crystallization studies, incubation of hydroxy-steroids, and similar work. They easily meet the most strict demands of hospitals, medical schools, research laboratories, military and public health centers and other organizations requiring efficient dry heat incubation or paraffin embedding within their temperature range.

Quality construction and features throughout make them suitable for the most stringent processes. Inner glass doors facilitate inspection of entire cabinet interior without disturbing temperature stability, and minimal power consumption permits continuous operation if required. Built-in overtemperature protection safeguards workload and equipment, and exclusive POWER-O-MATIC 70 Control provides true straight-line performance throughout the cabinets' extended operating range.

This is just one example of Blue M's complete line of Incubators and Sterilizers. Please see Index for page numbers of others.

SOLID-STATE PROPORTIONAL CONTROL SYSTEM MATCHED TO A CHAMBER OF PROVEN DESIGN FOR UNRIVALED PERFORMANCE AND ECONOMY

POWER-O-MATIC 70 Control System puts the miracle of modern electronic technology to work to provide truly proportional straight line performance at a highly competitive price. Extremely compact and simple, POWER-O-MATIC 70 consists of a temperature sensitive resistance network exercising phase control on two SCRs. Voltage is controlled by a Zener Diode.

In operation, POWER-O-MATIC 70 provides a control tolerance of ±0.5°C. with extremely fast response to temperature change. The response of the temperature sensor is measured in milliseconds. Overall performance is such as you might expect from temperature regulating instrumentation costing hundreds of dollars more. Now, thanks to this advanced control system, you can purchase a chamber which meets today's needs with the assurance that it can also be used for more critical work should the need arise in the future.

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

BLUE M

SEE PAGES 12 AND 13 FOR FULL DESCRIPTION OF PATENTED POWER-O-MATIC 70 CONTROL SYSTEM.

GENERAL SPECIFICATIONS AND PRICES

BUILT-IN DIRECT LINE OVERTEMPERATURE PROTECTION: Automatically shuts down unit should control fail. Prevents excessive temperature rise and resulting damage to equipment/workload. Separate from control circuit.

NOTE HOLDER: Metal card holder provides convenient place to keep records of unit performance, tests, etc.

ETERNA ELEMENTS: Black-Heat; "Controlled" low-watt density, even at maximum temperature. Reducing voltage reduces watt density. No thermal shock, no screws or welded parts; continuous elements with external connections.

VOLTMETER: Power input indication.

INTERIOR: All walls and inside of door(s) type 304, 18-8 stainless steel . . . excellent resistance to heat and corrosion. Shelves and brackets also stainless.

EXTERIOR: 2 STYLES AVAILABLE
A) All stainless steel, type 304, 18-8, or
B) Heavy gauge cold rolled steel. (All reinforced with minimum through-bracing . . . rugged all welded construction). Attractive FORMICA white baked-on enamel.

DOOR(S) AND HARDWARE: Full size, one-piece glass observation door and double wall outer door. Tubular stainless frame for extra strength. Outer door insulated with 4 in. Fiberglas, has tubular type gasket seal. Exclusive no-slam, cam action latches assure positive closure. Chrome-plated hinges and latches adjust to maintain tight seal.

INSULATION: Minimum 3½ in. thick blanket of non-hygroscopic, fireproof, Fiberglas wool; will not settle.

SHELVES (2): Wire rod type, stainless steel, electropolished. Adjustable in 2 in. steps.

READY-READ TEMPERATURE INDICATOR: 3½" diameter —for easier, more efficient operation. Stainless sensing bulb. Dual scale in degrees C. and F.

INTAKE PORTS AND VENTILATORS: Placement of intake ports facilitates natural air currents inside chamber. Double ventilators at top allow exhaust of obnoxious fumes—adjustable openings. Snap-in stainless covers.

WIRING: Complete, totally enclosed. Simply connect to power line. Meets N.E. Code, as amended. 3 wire cord, plug cap, strain relief, 6 ft. long, supplied for all models.

ALL STAINLESS STEEL MODELS

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Total VA	*Voltage 50/60 Hz. A.C. Single Phase	Cubic Feet Capacity	Shipping Weight Lbs. (Kg.)	Complete Price With OTP
POM-350A-2	20 (51)	15 (38)	20 (51)	28 (70)	26 (65)	41 (103)	500	120 V.	3.4	335 (152)	$1035.00
POM-360A-2	25 (63)	20 (51)	20 (51)	33 (84)	31 (78)	41 (103)	1000	120 V.	5.8	420 (191)	1235.00
**POM-370A-2	37 (93)	20 (51)	25 (63)	45 (84)	31 (78)	46 (116)	1100	120 V.	10.0	540 (245)	1820.00

ENAMELED STEEL EXTERIOR MODELS

POM-351A-2	20 (51)	15 (38)	20 (51)	28 (70)	26 (65)	41 (103)	500	120 V.	3.4	335 (152)	$870.00
POM-361A-2	25 (63)	20 (51)	20 (51)	33 (84)	31 (78)	41 (103)	1000	120 V.	5.8	420 (191)	985.00
**POM-371A-2	37 (93)	20 (51)	25 (63)	45 (84)	31 (78)	46 (116)	1100	120 V.	10.0	540 (245)	1525.00

*Units available for 240 V. and 208 V./1 Ph. We will supply a separate autoformer package complete with line cord and plug. Simple installation
Specify Part No. E17E-1-1 . . . . . $90.00 Each
**Has two doors but no center mullion

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories.

Series Number	Cabinet Type Floor Stand Heavy steel construction with auxiliary shelf and door. Attractive enamel finish compliments chamber. Catalog Number	Price Each	Extra Shelves All stainless steel Electropolished Part Number	Price Each
POM-350A	FS-143	$110.00	MO4-A102	$34.00
POM-360A	FS-144	115.00	MO4-A101	48.00
POM-370A	FS-145	145.00	MO4-A113	79.00

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly

BLUE M

STABIL-THERM®

Bench Type

gravity convection

LABORATORY OVENS

with

POWER-O-MATIC 70® PATENTED

solid-state proportioning control system and built-in overtemperature protection

TEMPERATURE RANGE:
+20°C. above ambient to +260°C. (+500°F.)

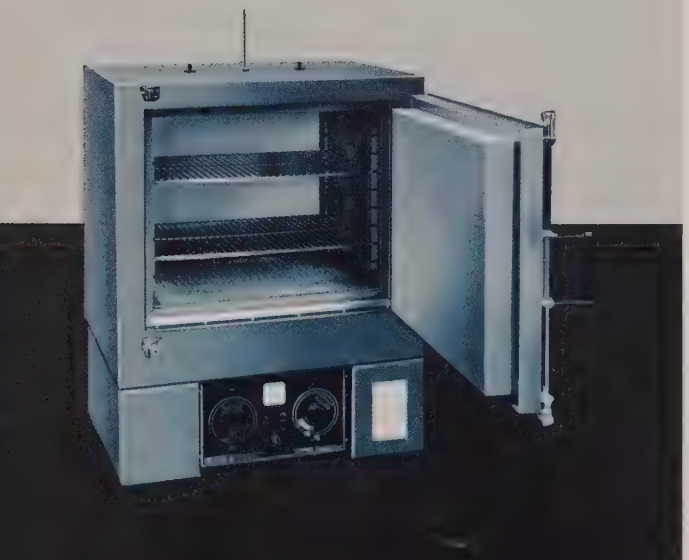
TEMPERATURE CONTROL TOLERANCE:
±0.5°C.

TEMPERATURE STABILITY: ±1.0°C.

BUILT-IN AMBIENT TEMPERATURE COMPENSATION
Chamber temperature remains constant (±0.2°C.) though ambient varied ±5°C.

BUILT-IN LINE VOLTAGE COMPENSATION
Chamber temperature remains constant (±0.2°C.) with a voltage change ±7 V. on 120 V.; ±15 V. on 240 V.

BUILT-IN RFI SUPPRESSION
Over 90% of Radio Frequency Interference eliminated.



ADVANCED CHAMBERS COMBINING CRITICAL PERFORMANCE AND SAFETY WITH MODEST PRICE

Blue M proudly presents this new family of Stabil-Therm Laboratory Ovens. They couple the patented POWER-O-MATIC 70 Control offering performance characteristics to rival the most costly commerical instrumentation with the low-cost, low-maintenance advantages of gravity convection design. The result is an economical group of chambers to meet the most discriminating standards. All models are U.L. Listed and Canadian Standards Approved, and have overtemperature protection as standard.

Besides superior performance, POWER-O-MATIC 70 also provides an extra measure of safety not found with conventional on-off controls. Completely solid-state in design, it has no arcing contacts or components—nothing to represent a potential hazard during operation. With more and more emphasis being placed on safety, the inherent safety characteristics of POWER-O-MATIC 70 plus built-in OTP are important considerations for anyone purchasing an oven.

As a glance at the various construction details of these ovens shows, these are first-quality chambers. They all incorporate proven features developed, modified and improved over a generation of oven design leadership. Many of these standard features are available only on special order elsewhere. Others are exclusive with Blue M.

Combined with the variety of popular sizes, types of construction and versatile temperature range, they make any of these Stabil-Therm ovens an outstanding value. You'd have to look long and hard to find a better one.

UL®
Guide No 165E9
File No E30112

CSA
File No. LR26058-1

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY

SEE PAGE 16

BLUE M

GENERAL SPECIFICATIONS AND PRICES

CONSTRUCTION: All Models double wall type, all welded. MODELS OV-708A, OV-712A, OV-718SA, OV-718SC, OV-725SC: Polished 18-8 stainless, Type 304, inside and out, for long lasting utility, beauty, and corrosion resistance.

MODELS OV-718A, OV-718C, OV-725C: Stainless interior; heavy steel exterior finished in FORMICA white baked-on enamel.

All instrumentation is integrally wired on an attractive, functional control panel, recessed to provide protection against spillage, etc.

INSULATION: All six sides insulated with thick blankets of compressed Fiberglas. Fireproof, non-hygroscopic.

DUAL ETERNA HEATING ELEMENTS: Heavy coiled nickel-chromium resistance wire over entire width of interior withstands +2150°F. Supported by grooved refractories: liberal air space between each coil. Refractories have high dielectric strength, are impervious to moisture or common acids, and stand +2600°F.

VOLTMETER: Power input indication.

DOOR AND HARDWARE: Double wall. Exclusive adjustable no-slam cam action latch and chrome-plated hinges maintain air-tight seal. Silicone rubber seal.

For MODELS OV-708A and OV-712A, and OV-718SA Series, the door exteriors are stainless steel. All other models with steel exteriors have steel doors finished in attractive light blue baked-on enamel for modern contrast.

INTAKE PORTS AND EXHAUST VENTS: Intake ports facilitate natural air currents inside chamber. Double vents at top (Model OV-708A only has one) exhaust fumes.

BUILT-IN DIRECT LINE OVERTEMPERATURE PROTECTION: Protects oven and workload. Features U.L. Listed switch and stainless capillary and sensor. Panel mounted. Mounted in base of unit on side, on Model OV-708A.

NEON PILOT LAMPS: Red, denotes unit operation; amber indicates elements are energized. Models OV-725C and OV-725SC have red lamp only.

SHELVES: Wire rod type, reinforced and removable. All models have two. Of electro-polished stainless or bright nickel-plated steel and adjustable to number of positions as indicated below:

Model	Stainless	Steel	Positions
OV-708A	X		3
OV-712A	X		5
OV-718SA, SC	X		6
OV-718A, C		X	6
OV-725SC,C	X		8

THERMOMETER: Glass, etched stem, 6-7mm. diameter, 2°C. graduations, 2 in. immersion, white background,mercury filled. Scale to match unit.

NOTE HOLDER: On Models OV-725SC, OV-725C. Provides place to keep unit records, tests run, etc.

WIRING: Complete, totally enclosed. Meets amended N.E. Code. Models OV-708A, OV-712A have 3-wire 6-foot line cord, rubber plug, strain relief. Others have terminal box. All models U.L. Listed, Canadian Standards Approved.

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Voltage 60 Hz. A.C. Single Phase	Maximum Watts	Shipping Weight Lbs. (Kg.)	Construction	Complete Price With OTP
OV-708A	8 (20)	8 (20)	8 (20)	13 (33)	13 (33)	18 (45)	*120 V.	525	25 (11)	All Polished Stainless Steel	$355.00
OV-712A	12 (31)	12 (31)	12 (31)	17 (43)	17 (43)	22 (55)	*120 V.	975	40 (18)		455.00
OV-718SA OV-718SC	19 (48)	18 (45)	15 (38)	27 (68)	26 (65)	30 (76)	120 V. **240 V.	1900	130 (59)	All Polished Stainless Steel	795.00 835.00
OV-718A OV-718C	19 (48)	18 (45)	15 (38)	27 (68)	26 (65)	30 (76)	120 V. **240 V.	1900	130 (59)	Stainless Interior, Enamel Exterior	590.00 610.00
OV-725SC	25 (63)	20 (51)	19½ (49)	33 (84)	32 (80)	42 (105)	**240 V.	2400	375 (170)	All Polished Stainless Steel	1080.00
OV-725C	25 (63)	20 (51)	19½ (49)	33 (84)	32 (80)	42 (105)	**240 V.	2400	375 (170)	Stainless Interior, Enamel Exterior	860.00

NOTE 240 V./1 Ph units may be connected to any two wires of a three-phase line
*Units available for 240 V and 208 V./1 Ph We will supply a separate autoformer package complete with line cord and plug Simple installation Specify Part No E17E-1-1 ..... $90.00 Each
**These units will operate reliably when connected to 208-volt service A 25% reduction in element power will result

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Model Number	Extra Shelves (As described above) Part Number	Price Each	Extra Glass Thermometer (As described above)	Double Glass Observation Panels. Clear tempered glass, built-in. Located in center of door with stainless opening and framing. *For delivery with unit only.*	Cabinet Type Floor Stand. Heavy steel construction, with auxiliary shelf and door. Chrome-plated latch. Attractive enamel finish complements chamber.
OV-708A	MO4-A109	$8.00	Part No. CO1C-3	4"W.x4"H. (GPA-110): $65.00	Not Available
OV-712A	MO4-A108	15.00	$10.00 Ea.	6½"W.x8"H. (GPA-100): $75.00	
OV-718SA OV-718SC	MO4-A104	29.00	Part No. CO1C-5	12¾" W. x 9¼" H. Cat. No. GPA-101X Price Installed: $95.00	Cat. No. FS-186 Price Each: $110.00 Shipping Weight: 75 lbs.
OV-718A OV-718C	MO4-A204	14.50	$13.00 Ea.		
OV-725SC OV-725C	MO4-A101	48.00	Part No. CO1C-5 $13.00 Ea.		Cat. No. FS-144 Price Each: $115.00 Shipping Weight: 100 lbs.

Automatic Timers—built-in to control operating periods (For all models)	
Program Type 24 Hour-Installed	Shut-off Type 6 Hour-Installed
Part No. C12A-1 $65.00 Installed	Part No. C12D-3 $35.00 Installed

ALSO AVAILABLE FOR ALL MODELS (except Models OV-708A and OV-712A): A 3 in. diameter lead-in port and snap-in stainless steel cover. Provides entrance into work chamber as required. Standard location is in center of back wall. Cat. No. POR-100C ..... $45.00 Installed

BLUE M

STABIL-THERM®

Bench Type

gravity convection

LABORATORY OVENS

with built-in overtemperature protection

TEMPERATURE RANGE
+38°C. to +288°C. (+550°F.)

POWER SELECTOR SWITCH
Selects proper wattage
Stable temperatures

AUTOMATIC TRIGGER CONTROL
U.L. Listed—Sensitive response: ±0.5°C.

DUAL ETERNA ELEMENTS
Black heat—Fully guaranteed
Double bank—Refractory framing

ALL POLISHED STAINLESS STEEL
OV-18S Series only
Double wall construction
Stainless steel sheves
OV-18 Series—FORMICA white enamel exterior, light blue enameled door

NO-SLAM, ADJUSTABLE CAM ACTION LATCH AND HINGES

FIBERGLAS INSULATION
All six sides—3½" thick

ALL WIRING ENCLOSED
Ready for service
U.L. Listed.
Canadian Standards Approved

MEMORY RING® TEMPERATURE CALIBRATING DIAL

BLUE M ETERNA ELEMENT DESIGN PROVIDES FASTER RESPONSE . . . LONGER SERVICE! DESIGNED SPECIFICALLY FOR EACH VOLTAGE TO INSURE THE BEST ELEMENT DESIGN LIFE

PROVEN DESIGN . . . FOR EASIER, SAFER OPERATION
These ultra modern U.L. Listed and Canadian Standards Approved ovens have more than proven their value for years in laboratories and industry. Recent design improvements have made them even more safe, convenient and economical to operate. The new recessed control panel protects all control components from any possible damage due to spillage or accidental bumping. Can be easily removed as a single unit for inspection. Now overtemperature protection is built-in for maximum oven and workload safety.

The Power Selector Switch lets you choose the correct wattage for low, medium or high temperature . . . an economy feature that saves dollars and dollars of operating cost. Also, reduces troublesome "overshooting" and "undershooting" of desired temperature. Solidly built, carefully designed for the operator's convenience, these ovens will give you years of trouble-free service. You'll find them the best available for baking, drying, preheating, aging, sterilizing, conditioning, tempering, and other procedures.

Guide No. 165E9
File No E30112

File No. LR26058-1

EQUIPMENT COVERED BY OUR EXCLUSIVE
PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY BLUE M

SEE PAGE 16

BLUE M

GENERAL SPECIFICATIONS AND PRICES

CONSTRUCTION: Double wall type.
OV-18S Series—Excellent resistance to corrosion. Outer housing, door, base, backplate and inner chamber are all polished 18-8 stainless, type 304; spot welded and arc welded to form a beautiful, strong, rigid unit. All instrumentation is integrally wired on an attractive modern recessed wiring panel for easy operation and quick inspection. Also provides protection from spillage or accidental temperature changing.

OV-18 Series—Same as above, but exterior is heavy gauge steel, finished in a beautiful baked-on, FORMICA white enamel—durable and resistant.

INSULATION: All six sides insulated with Fiberglas, approximately 3½ in. thick. Perfect thermal equilibrium. Fireproof, non-hygroscopic, will not settle or deteriorate with age.

AUTOMATIC TRIGGER CONTROL: A sensitive stepless, hydraulic thermostat is mounted in front of base panel. Large silver contacts. Control listed by Underwriters' Laboratories, Inc. and Canadian Standards. Memory Ring Dial assures temperature reproducibility and unmatched operating ease.

DOOR AND HARDWARE: Insulated double wall, with stainless interior. Two chrome-plated hinges. Exclusive no-slam, cam action latch assures positive closure. Tubular silicone rubber seal eliminates leakage. Hinges and latch adjust to maintain tight seal for unit's lifetime. Attractive light blue baked-on enamel finish.

POWER SELECTOR AND ON-OFF SWITCH: Reduces wattage input when oven is used for low or medium temperature ranges. Operator can employ low, medium or higher wattages depending on desired temperature. Saves currents costs. Insures quick stabilization of desired temperature. Reduces troublesome "overshooting" and "undershooting" of working temperature.

DIRECT LINE BUILT-IN OVERTEMPERATURE PROTECTION: Protects oven and workload. Features U.L. Listed switch and stainless capillary and sensor. Conveniently panel mounted with other instrumentation.

NEON PILOT LAMPS (2): To provide adequate visual check; red to denote unit operation and amber to indicate when elements are energized.

DUAL ETERNA HEATING ELEMENTS: Heavy, helically coiled Eterna Heaters withstand +2150°F., spread over entire base of inside chamber. Positive temperature control assured, irrespective of Power Selector Switch setting. Elements supported by grooved, ceramic refractories forming a rectangular frame, with liberal air space between each pass. Refractories used have a high dielectric strength, are impervious to moisture and common acids, and can withstand temperature of +2600°F.

DOUBLE EXHAUST VENTS: Tubular design for exhausting fumes and moisture. Fitted with stainless steel covers for control of exhaust fumes and vapor escapement.

INTAKE PORTS: At bottom of oven. Scientifically placed to allow fresh air to enter, providing proper air-flow pattern.

SHELVES: OV-18S Series has two stainless wire shelves. They are removable and adjustable to six positions. OV-18 Series has two steel wire type shelves, brightly nickel-plated.

THERMOMETER: Glass, etched stem, 6-7 mm. diameter, 2°C. graduation, 16 in. long, 2 in. immersion, white backgound, mercury filled. 0°C. to +300°C. scale.

WIRING: All wiring is complete and totally enclosed. All models U.L. Listed and Canadian Standards Approved. Terminal box provided.

Model Number	*Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Voltage 60 Hz. A.C. Single Phase	Maximum Watts	Shipping Weight Lbs. (Kg.)	Construction	Complete Price With OTP
OV-18SA OV-18SC	19 (48)	18 (45)	15 (38)	27 (68)	26 (65)	30 (76)	120 V. **240 V.	1900	130 (59)	All Polished Stainless Steel Type 304, 18-8	$690.00 725.00
OV-18A OV-18C	19 (48)	18 (45)	15 (38)	27 (68)	26 (65)	30 (76)	120 V. **240 V.	1900	130 (59)	Stainless Interior and Enameled Steel Exterior	475.00 498.00

*Capacity of all models is 3.0 cu. ft
**These models will operate reliably when connected to 208 volt service. A 25% reduction in element power will result
NOTE 240 V./1 Ph. units may be connected to any two wires of a three phase line

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories

Series Number	Extra Shelves (As described above) Part Number	Price Each	Extra Glass Thermometer (As described above for either model)	Double Glass Observation Panels Clear tempered glass, built-in, located in center of door with stainless opening and framing. (For either model) *For delivery with unit only.*	Cabinet Type Floor Stand Heavy steel construction, with auxiliary shelf and door. Chrome-plated latch. Attractive enamel finish complements chamber. Size: 27" W. x 21" D. x 29" H. (For either model)
OV-18S	MO4-A104	$29.00	Part No. CO1C-5 Price Each $13.00	Viewing Area: 12¾" W. x 9¼" H. Cat. No. GPA-101X Price Installed: $95.00	Cat. No. FS-186 Price Each: $110.00 Shipping Weight: 75 lbs.
OV-18	MO4-A204	14.50			

Automatic Timers—built-in to control operating periods	
Program Type 24 Hour-Installed with shunt switch (For either model)	Shut-off Type 6 Hour-Installed (For all models)
Part No. C12A-1 Price Installed $65.00	Part No. C12D-3 Price Installed $35.00

ALSO AVAILABLE FOR ALL MODELS: A 3 in. diameter lead-in port and stainless steel snap-in cover. Provides entrance into work chamber as required. Standard location is in center of back wall.
Cat. No. POR-100C ..... $45.00 Installed

*NOTE: For field installation of above timers on 240 V. units, specify autoformer Part No. E17A-2-1 ..... $14.00 Each

BLUE M

STABIL-THERM®

Bench Type

gravity convection

LABORATORY OVENS

with built-in overtemperature protection

TEMPERATURE RANGE
+38°C. to +260° C. (+500°F.)

ALL POLISHED STAINLESS STEEL
Double wall construction
Stainless steel shelves

AUTOMATIC TRIGGER CONTROL
U.L. Listed
Sensitive response: ±0.5°C.

POWER SELECTOR SWITCH
Selects proper wattage
Stable temperatures
Power saver

FIBERGLAS INSULATION
All six sides; 2 inches thick

ETERNA HEATING ELEMENTS
Double bank—Refractory framing
Black heat—Fully guaranteed

WIRING ENCLOSED
U.L. Listed
Canadian Standards Approved
Ready for instant service
3 wire cord and plug

MEMORY RING® TEMPERATURE CALIBRATING DIAL

MODEL OV-12A

MODEL OV-8A

IMPROVED AND ACCEPTED WITH ADDITION OF

- U.L. LISTING
- CSA APPROVAL
- OVERTEMPERATURE PROTECTION
- POWER SELECTOR SWITCH
- HIGHER TEMPERATURE RANGE

PROVEN DESIGN . . . EASIER, SAFER SMALL OVEN OPERATION: All polished stainless steel, type 304, 18-8, rugged in construction, these versatile and dependable ovens are designed to offer maximum resistance to corosive atmospheres and to withstand maximum abuse. The new recessed control panel protects all control components from any possible damage due to spillage or accidental bumping. Can be easily removed as a single unit for inspection. Now overtemperature protection is built-in for maximum oven and workload safety. The Automatic Trigger Control is a proven, powerful, automatic, hydraulic electric, thermostat control which is sensitive to temperature changes. Our experience proves years of service will be obtained without the need for any maintenance.

These units are ideal for analytical laboratory and general chemical work involving baking, drying, conditioning, preheating and many other laboratory procedures.

Guide No. 166E9
File No. E30112

File No. LR26058-1

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY

SEE PAGE 16

BLUE M

GENERAL SPECIFICATIONS AND PRICES

CONSTRUCTION: Double wall housing and door of all polished stainless, inside and out, for long wearing utility, beauty, and maximum resistance to corrosion. All controls, pilot lamps and switches, are integrally wired on an attractive modern recessed wiring panel which permits quick inspection and easy operation. Also provides protection from spillage or accidental temperature changing.

INSULATION: All six sides insulated with a minimum of 2 in. thick blanket of Fiberglas wool; fireproof, moisture-proof, will not settle or deteriorate with age.

DUAL ETERNA HEATING ELEMENTS: Heavy helically coiled Eterna Heaters withstand +2150°F. is spread over entire base of inside chamber. Positive temperature uniformity assured, irrespective of Power Selector Switch setting. Elements supported by grooved, ceramic refractories forming a rectangular frame, with liberal air space between each pass. Refractories used have a high dielectric strength, are impervious to moisture and common acids, and can stand +2600°F.

INTAKE PORTS: At bottom, allow fresh air to enter for setting up proper air-flow patterns.

EXHAUST PORTS (2): At top, with stainless steel adjustable covers to control fume and vapor escapement. Model OV-8A has single port.

NEON PILOT LAMPS (2): Red denotes oven operation. Amber indicates control action.

DIRECT LINE BUILT-IN OVERTEMPERATURE PROTECTION: Protects oven and workload. Features U.L. Listed switch and stainless capillary and sensor. Panel mounted. Mounted in base of unit on right side on Model OV-8A.

AUTOMATIC TRIGGER CONTROL: A sensitive, powerful, automatic hydraulic electric thermostat is conveniently mounted on control panel to allow easy setting of any temperature. Fine, extra large, silver contacts are totally enclosed. Memory Ring Dial assures temperature reproducibility and unmatched operating ease. Listed by Underwriters' Laboratories, Inc., and Canadian Standards.

POWER SELECTOR AND ON-OFF SWITCH: Used with Automatic Control, regulates wattage input for low, medium or high temperatures. Provides quick, stable temperatures, reduces to a minimum troublesome "overshooting" or "undershooting," and saves operating costs.

DOOR: Double wall, Fiberglas insulated. No-slam, cam-action latch and chrome-plate hinges. Heavy silicone tubular gasket around door perimeter for positive seal. Door hinges on right side.

SHELVES: Two supplied. Adjustable to five positions in OV-12A; adjustable to three positions in OV-8A. All shelves are constructed of bright, electro-polished stainless wire to permit maximum air movement.

THERMOMETER: Glass, etched stem, 6-7 mm. diameter, 2°C. graduations, 12 in. long, 2 in. immersion, white background, mercury filled. 0°C. to +260°C. scale.

WIRING: All wiring complete and totally enclosed. Equipped with molded 3 wire 6 foot line cord, rubber plug, and strain relief. Ready for use. All U.L. Listed and Canadian Standards Approved.

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	*Voltage 60 Hz. A.C. Single Phase	Cubic Feet Capacity	Maximum Wattage	Shipping Weight Lbs. (Kg.)	Complete Price With OTP
OV-12A	12 (31)	12 (31)	12 (31)	17 (43)	17 (43)	22 (55)	120 V.	1.0	975	40 (18)	$349.00
OV-8A	8 (20)	8 (20)	8 (20)	13 (33)	13 (33)	18 (45)	120 V.	0.3	525	25 (11)	266.00

*Units available for 240 V. and 208 V./1 Ph. We will supply a separate autoformer package complete with line cord and plug. Simple installation
Specify Part No E17E-1-1..... $90.00 Each

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories.

Model Number	Extra Shelves Electropolished Stainless Steel: Part Number	Extra Shelves Electropolished Stainless Steel: Price Each	Extra Glass Thermometer (As described above)	Double Glass Observation Panels Clear tempered glass, built-in located in center of door with stainless opening and framing. For delivery with unit only.	Automatic Timers—Built-in to control operating periods: Program Type 24 Hour-Installed with shunt switch (For Either Model)	Automatic Timers—Built-in to control operating periods: Shut-off Type 6 Hour-Installed (For Either Model)
OV-12A	MO4-A108	$15.00	Part No. CO1C-3 Price Each $10.00	Viewing Area: 6½" W. x 8" H. Cat. No. GPA-100 Price Installed $75.00	Part No. C12A-1 Price Installed $65.00	Part No. C12D-3 Price Installed $35.00
OV-8A	MO4-A109	$8.00		Viewing Area: 4" W. x 4" H. Cat. No. GPA-110 Price Installed: $65.00		

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly

BLUE M

Economy

Bench Type Utility

gravity convection

LABORATORY OVENS

with built-in overtemperature protection

TEMPERATURE RANGE
+40°C. to +260°C. (+500°F.)

AUTOMATIC TRIGGER CONTROL
U.L. Listed—Sensitive response: ±0.5°C.

POWER SELECTOR SWITCH
Selects proper wattage
Stable temperatures
Power saver

DUAL BANKED ETERNA ELEMENTS

DOUBLE WALL CONSTRUCTION
Cold rolled oven steel, inside and out

ALL WIRING ENCLOSED
Ready for use—U.L. Listed
Canadian Standards Approved

CHROME-PLATED LATCH AND STRIKE

BAKED-ON ENAMEL FINISH

MEMORY RING® TEMPERATURE CALIBRATING DIAL

LOW, MEDIUM, HIGH WATTAGE HEATER BANKS WITH POWER SELECTOR SWITCH

DESIGNED TO FIT YOUR NEEDS—AND YOUR BUDGET

This entire series of four popular sizes is listed by the Underwriters' Laboratories and Canadian Standards and now has overtemperature protection built-in for maximum oven and workload safety.

Blue M's Dual Bank of Eterna Heaters minimizes "overshooting" and "undershooting" of set temperatures. Each half of the heater is individually controlled by a power selector switch. Therefore, when lower temperatures are required only one switch is turned on, thus saving current costs and minimizing troublesome "overshooting" and "undershooting" of set temperatures.

For analytical laboratories and general work involving baking, drying, conditioning, stress relieving of optical parts, preheating, etc., you will find these rugged ovens stand up to hard usage and give long service. Wide temperature range adds to unit versatility.

Guide No. 165E9
File No. E30112

File No. LR26058-1

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY BLUE M

SEE PAGE 16

BLUE M

GENERAL SPECIFICATIONS AND PRICES

CONSTRUCTION: Double wall housing and door of heavy gauge steel. Interior finished in a high temperature aluminum; exterior attractive blue enamel.

INSULATION: All six sides insulated with 2¼ in. thick Fiberglas: fireproof, moisture-proof, will not settle or deteriorate.

DUAL ETERNA HEATING ELEMENTS: Heavy, helically coiled Eterna Heaters, which withstand +2150° F., over entire base of inside chamber. Positive temperature uniformity assured, irrespective of Power Selector Switch setting. Elements supported by grooved, ceramic refratories forming a rectangular frame. Have a high dielectric strength, are impervious to moisture and common acids and can stand +2600° F.

POWER SELECTOR AND ON-OFF SWITCH: Used in conjunction with Automatic Control, permits regulation of wattage input for low, medium or high temperatures.

NEON PILOT LAMPS (2): Red denotes oven operation. Amber indicates control action.

DOOR: Double wall, Fiberglas insulated. No-slam, cam-action latch and chrome-plate hinges. Heavy silicone tubular gasket around door perimeter for positive seal. Door hinges on right side.

DIRECT LINE BUILT-IN OVERTEMPERATURE PROTECTION: Protects oven and workload. Features U.L. Listed switch and stainless capillary and sensor. Conveniently panel-mounted with other instrumentation.

AUTOMATIC TRIGGER CONTROL: Sensitive stepless, hydraulic thermostat mounted in front of base panel. Large silver contacts. Control listed by U.L. and Canadian Standards. Memory Ring Dial assures temperature reproducibility and unmatched operating ease.

SHELVES (2): Removable, constructed of wire rod. Brightly nickel-plated. Adjustable in 2 in. steps.

VENTILATING: Intake ports at bottom allow fresh air to enter for proper air-flow. Double exhaust vents at top with stainless adjustable covers, control fumes or vapor removal.

THERMOMETER: Glass, etched stem, 6-7 mm. diameter, 2° C. graduations, 12 in. long, 2 in. immersion, white background, mercury filled. 0° C. to +260° C. scale.

WIRING: All wiring complete and enclosed. U.L. listed and Candian Standards Approved. Models OV-480 and OV-484 have terminal box; others have molded 3 wire 6 foot SJO heater cord, plug and strain relief.

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	*Voltage 60 Hz. A.C. Single Phase	Cubic Feet Capacity	Maximum Watts	Shipping Weight Lbs. (Kg.)	Complete Price With OTP
OV-460A	12 (31)	12 (31)	12 (31)	17 (43)	18 (45)	23 (58)	120 V.	1.0	650	60 (27)	$380.00
OV-470A	16 (40)	14 (35)	16 (40)	21 (53)	20 (51)	27 (68)	120 V.	2.0	1100	90 (40)	440.00
OV-480A	20 (51)	16 (40)	20 (51)	25 (63)	23 (58)	31 (78)	120 V.	3.5	1600	150 (68)	520.00
OV-484A	19 (48)	18 (45)	28 (70)	24 (61)	25 (63)	40 (101)	120 V.	5.5	2100	140 (63)	610.00

*Units available for 240 V. and 208 V./1 Ph. We will supply a separate autoformer package complete with line cord and plug. Simple installation.

For Models Nos. OV-460A and OV-470A
Specify Part No. E17E-1-1 ..... $90.00 Each

For Model Nos. OV-480A and OV-484A
Specify Part No. E17E-1-2 ..... $120.00 Each

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories

Model Number	Extra Shelves Wire Rod Steel Nickel-plated Catalog Number	Price Each	Extra Glass Thermometer (As described above for all models)	Double Glass Observation Panels Clear tempered glass, built-in center of door with stainless opening and framing. *For delivery with unit only.*	Cabinet Type Floor Stand Heavy steel construction, with auxiliary shelf and door. Chrome-plated latch. Blue enamel finish.
OV-460A	MO4-A208	$10.00	Part No. CO1C-3 Price Each $10.00	Viewing Area: 6½" W. x 8" H. Cat. No. GPA-100 Price Installed: $75.00	Cat. No. FS-184 Price Each: $90.00 For OV-460A 20" W. x 18" D. x 33" H.
OV-470A	MO4-A209	14.50			
OV-480A	MO4-A210	16.00		Viewing Area: 11½" W. x 16¼" H. Cat. No. GPA-102 Price Installed: $110.00	Cat. No. FS-186 Price Each: $110.00 For OV-470A, OV-480A, OV-484A 27" W. x 22" D. x 33" H.
OV-484A	MO4-A204	14.50			

Automatic Timers—built-in to control operating periods	
Program Type 24 Hour-Installed with shunt switch (For All Models)	Shut-off Type 6 Hour-Installed (For All Models)
Part No. C12A-1 Price Installed $65.00	Part No. C12D-3 Price Installed $35.00

ALSO AVAILABLE FOR ALL MODELS: A 3 in. diameter lead-in port and stainless steel snap-in cover. Provides entrance into work chamber as required. Standard location is in center of back wall.
Cat. No. POR-100C ..... $45.00 Installed

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly

BLUE M

Infra-Oven

INFRA-RED DRYING OVENS

***TEMPERATURE RANGE:** Room to +220°C. (+428°F.)
***RUN-UP TIME:** To +200°C.: 5 minutes
To +220°C.: 10 minutes
As determined using a 20 ga. I/C Thermocouple.

INFINITELY VARIABLE RADIATION—SOLID-STATE DESIGN
Controlled radiation source gives complete control of process heating and/or evaporation rates. A Blue M first.

MIRROR FINISHED ALUMINUM INTERIOR
Reflects infra-red rays, which might otherwise be lost, back to the workload.

SLIDING TEMPERED GLASS DOOR
Retains heat, controls air current, and serves as operator safety shield.

*Maximum temperature and rate of workload temperature rise will vary greatly depending on color surface condition and other factors that determine the material's ability to accept infra-red radiation.

CONTROLLED INFRA-RED RADIATION WITH SOLID-STATE INPUT CONTROLLER

Blue M's Infra-Oven is a safe, dependable and reliable means to subject test samples to infra-red radiation. Featuring an exclusive solid-state stepless input controller with built-in on-off switch, the oven can be used for many heating, baking, heat curing, evaporating and drying procedures It is also ideal for softening or melting waxes, plastics, tars and other low melting point solids or semi-solids.

However, its prime use is for evaporating or drying. Its controlled source of infra-red radiation—under control of the operator at all times—quickly and efficiently heats the surface of a liquid. This causes the surface to evaporate rapidly without bringing the entire body of the liquid to the boiling point. There is no liquid spatter.

The infinitely variable Infra-Oven Control System permits such exacting work as the evaporation of low boiling point solvents to be conducted with improved safety. The operator has complete control of evaporation and heating FROM OUTSIDE THE CHAMBER. He can change the heating capability of the unit WITHOUT having to move the hot sample or the lamp closer together or further apart as is required in competitive models. Besides the obvious safety of this design, it greatly extends the life of the already long-lived infra-red lamp.

Mirror finished aluminum on the three side walls of the test chamber reflects and concentrates the infra-red rays on the test sample which otherwise would be lost by convection and conduction through the unit walls. This unique feature permits higher maximum temperatures and greater evaporation speed and efficiency to be achieved with relatively low operating expense. Temperature of the exterior is also kept to a minimum.

The vertical sliding clear tempered glass door helps retain convected heat, and acts as a damper to control the amount of air current through the work chamber. It also serves as a transparent safety shield, protecting the operator while enabling him to view the workload at all times.

EQUIPMENT COVERED BY OUR EXCLUSIVE
PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM
WARRANTY
BLUE M
SEE PAGE 16

BLUE M

GENERAL SPECIFICATIONS AND PRICES

CONSTRUCTION: Heavy gauge sheet steel housing with attractive, functional heat and stain resistant grey baked-on enamel finish. Louvered vents at sides and back plus heavy expanded metal covered top dissipates excess heat and keeps exterior temperature low. Interior rear and side walls of mirror finished aluminum to reflect and concentrate radiation on workload. Chamber bottom is polished stainless of special design which automatically centers test samples under infra-red lamp for maximum radiation benefit. Also helps avoid spilling of samples. Corrosion resistant qualities of stainless minimizes damage should spilling occur. Bottom design and polished surface as well as polished stainless chamber top also help concentrate radiation on work sample.

INSULATION: Marinite under stainless work chamber bottom to further protect control compartment from heat. Reflective qualities of mirror finished chamber sides serves as ample work chamber insulation.

CONTROL COMPARTMENT: Houses control system. Same construction as chamber. Well ventilated. Oven proper is elevated from control compartment on four ceramic supports. Resulting air space insulates and protects control from high temperatures. Entire unit rests firmly on four rubber feet.

CONTROL SYSTEM: Superior Blue M system provides infinitely variable radiation and assures absolute control of heating and/or evaporation rates. Solid-state design for reliable, long-life service. Dual function mechanism has built-in on-off switch. Single, easily operated control knob turns oven on and off, and regulates radiation. Centered in attractive control panel with reference numbers to facilitate regulation of intensity.

DOOR: Clear tempered glass. Retains chamber heat, provides air current control, and shields operator while providing full visibility of chamber and workload. Opens vertically and holds open in any desired position. Glides smoothly on long-lasting Teflon track. Bakelite handle.

RADIATION SOURCE: Quality 375-watt reflector type infrared lamp. Rated for 5,000 hours operation at maximum intensity. However, superior design of Blue M's Infra-Oven and positive, variable control conserves heat and regulates radiation so that testing is accomplished with lower lamp intensity. Maximum intensity is not needed for most test work, greatly extending lamp life. At 90% intensity, for example, lamp life is approximately 10,000 hours—twice its normal rating.

WIRING: Complete, meets N.E. Code, as amended. Unit comes ready to use, with 3-wire line cord and plug.

Model Number	Inside Dimensions Inches (Cm.)			Overall Dimensions Inches (Cm.)			*Voltage 50/60 Hz. A.C. Single Phase	Total VA	Approximate Shipping Weight Lbs. (Kg.)	Complete Price
	W.	D.	H.	W.	D.	H.				
IR-77	6¼ (16)	7 (18)	5¼ (13)	9 (23)	9 (23)	19 (48)	120 V.	375	30 (13)	$180.00

*Unit available for 240 V. and 208 V./1 Ph. We will supply a separate autoformer package complete with line cord and plug. Simple installation.

Specify Part No. E17E-1-1 ..... $90.00 Each

BLUE M

Improved Single-Wall FLEXBOARD® GRAVITY OVENS

HIGHER TEMPERATURE RANGE: +40°C. to +200°C.

STEEL EXTERIOR

BAKED-ON ENAMEL FINISH

LOW IN COST

RUGGED IN CONSTRUCTION

YEARS OF SERVICE

(2) POPULAR LABORATORY SIZES AVAILABLE

MEMORY RING® TEMPERATURE CALIBRATING DIAL

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY BLUE M SEE PAGE 16

Registered Trademark Johns-Manville.

BUDGET PRICED UTILITY MODELS FOR LABORATORY AND GENERAL HEATING PROCEDURES

Of particular interest are the Higher Temperature Range and the Automatic Hydraulic Thermostat coupled with the heavy steel base and shell surrounding the ⅜ in thick FLEXBOARD walls. FLEXBOARD, an asbestos-cement sheet, is tough and durable. Will not rot, rust, crack or chip. Assures years of dependable service. Oven extremely useful for most general non-critical laboratory procedures. Sturdily built to give long, trouble free operation. For preheating, drying sterilizing, baking, aging, etc

GENERAL SPECIFICATIONS AND PRICES

AUTOMATIC HYDRAULIC THERMOSTAT
U.L. Listed—Sensitive and reliable

ETERNA HEATER BANKS
For long-lived service

FLEXBOARD WALLS ⅜ IN. THICK SUPPORTED IN HEAVY STEEL HOUSING AND FRAMING
Attractive blue baked-on enamel finish, white door.

FRESH AIR INTAKES

LARGE EXHAUST PORT—Adjustable

NEON LAMPS—plus—**ON-OFF SWITCH**
Red—for oven "ON"
Amber—for thermostat "action"

WIRE ROD TYPE SHELVES—Adjustable
Bright, nickel-plated—2 furnished

GLASS THERMOMETER—0°C. to +260°C., 2°C. Graduations.

ENCLOSED WIRING—Models SW-11TA and SW-11TC come complete with line cord and plug, ready to use. **However, due to many local codes, Models SW17TA and SW-17TC come equipped with only a terminal box. 3-wire cords and plugs are available but must be ordered. See Accessory listing below.**

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories

EXTRA THERMOMETER
Part No. CO1C-3 ..... $10.00 Each

LINE CORDS AND PLUGS. For customer installation.
For Model SW-17TA: Part No. EO7A-2 ..... $11.00 Each
For Model SW-17TC: Part No. EO7A-4 ..... $14.00 Each

EXTRA SHELVES
SW-11T SERIES: Part No. MO4-A212 ..... $9.50 Each
SW-17T SERIES: Part No. MO4-A211 ..... $12.50 Each

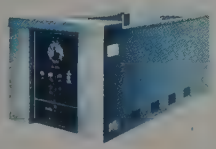
Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Voltage 50/60 Hz. A.C. Single Phase	Cubic Feet Capacity	Total VA	Shipping Weight Lbs. (Kg.)	Complete Price
SW-11TA	10½ (26)	11½ (29)	10 (25)	12 (31)	14 (35)	17 (43)	120 V.	0.7	900	40 (18)	$125.00
SW-11TC	10½ (26)	11½ (29)	10 (25)	12 (31)	14 (35)	17 (43)	*240 V.	0.7	900	40 (18)	135.00
SW-17TA	16½ (41)	11½ (29)	16 (40)	18 (45)	14 (35)	23 (58)	120 V.	1.8	1600	70 (32)	180.00
SW-17TC	16½ (41)	11½ (29)	16 (40)	18 (45)	14 (35)	23 (58)	*240 V.	1.8	1600	70 (32)	195.00

*These models will operate reliably when connected to 208 volt service
A 25% reduction in element power will result

BLUE M

BLUE M

BATH SECTION INDEX



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JAR BATHS
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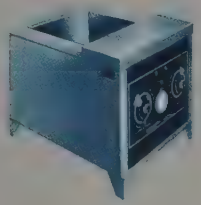

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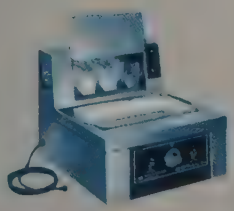

TISSUE BATHS
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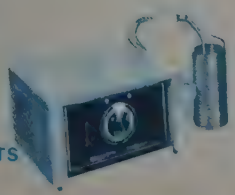

PORTABLE COOLING UNITS
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Pages

INTRODUCTION: The patented MAGNI-WHIRL® Agitation System with advanced solid-state design 92-93

WATER BATHS: Rectangular
MAGNI-WHIRL, POWER-O-MATIC 75® Control; +100°C. 94-95
MAGNI-WHIRL, Dual Microtrol Control; +100°C. 96-97
MAGNI-WHIRL, High Powered, Dual Microtrol Control, +100°C. 98-99
MAGNI-WHIRL, Fast Setting, Mercury Thermoregulator; +100°C. 100-101

SHAKER BATHS
MAGNI-WHIRL, Dual Microtrol Control;
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MAGNI-WHIRL, 10 Jars; +50°C. 106-107

REFRIGERATED BATHS
MAGNI-WHIRL, POWER-O-MATIC 75®
Control; 0°C. to +100°C. 110-111
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-10°C. to +70°C. 116-117

TISSUE FLOTATION BATHS
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MAGNI-WHIRL, Full Visibility, Dual Microtrol Control; +100°C. 104-105

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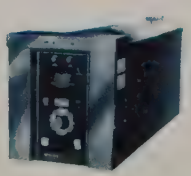
Refrigerated, Microtrol Control; -40°C. to Ambient 124-125
Portable Cooling Probe; -35°C. to Ambient 126

DON'T MISS THESE SPECIAL - INTEREST BATHS



Solid-State Controlled Water Baths
Feature POWER-O-MATIC 75® Control and other fine advantages for the ultimate in performance at a competitive price. See Page 94.

High-Powered Water Baths
Designed specifically for those needing fast run-up characteristics as well as high temperature reliability over long periods. See Page 98.

Magni Whirl®
PATENTED IN U.S.A AND CANADA

CONSTANT TEMPERATURE BATHS

MODERN SCR AGITATION SYSTEM AND EVER-CYCLE SWITCHING CIRCUIT MAKES THE FINEST BATHS YOU CAN BUY MORE RELIABLE AND EFFICIENT THAN EVER!

TIMING AND POWER RELAYS ELIMINATED

Unique MAGNI-WHIRL agitation system which made conventional methods obsolete . . . now virtually trouble-free! There are no timing relays . . . nothing moving or wearing . . . no contacts . . . nothing to cause breakdowns! Turn it on. It will run—without attention—almost indefinitely! MAGNI-WHIRL Baths also feature solid-state EVER-CYCLE switching circuit where applicable. Controls high wattage heating elements with very low current through microswitches. Eliminates power relays and moving parts . . . extends microswitch life of Dual Microtrol . . . greatly improves reliability. Quiet, safe, sure!

NOISE ELIMINATED

MAGNI-WHIRL is quiet. Previous relay clicking is gone. MAGNI-WHIRL is so quiet that we've added a neon pilot light to show pulsation rate . . . to prove that the bath is actually working!

VARIABLE AGITATOR PULSATION

While every bath is factory set for optimum temperature control and uniformity, these MAGNI-WHIRL Baths let you change the speed of the agitator pulsation if ever necessary. You can speed up or slow down to practically any rate—and duplicate this exactly. This assures repeatability . . . enables identical pulsating characteristics to be duplicated in several baths whenever this is needed.

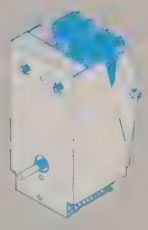
IMPROVED FLUID DIRECTIONAL FLOW

MAGNI-WHIRL Baths feature counterweighted rocker type plate agitator for many models to improve efficiency. Other models only require the spring-loaded perforated plate used before. You still get the exclusive MAGNI-WHIRL magnetic action with its unmatched efficiency . . . but this design greatly improves fluid directional flow while eliminating the possibility of spring fatigue after extended periods of operation. Baths can be operated indefinitely—even at faster rates—efficiently and trouble-free.

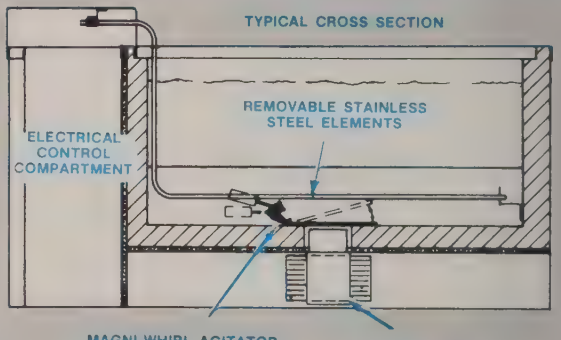
VIRTUAL IMMUNITY TO LINE VOLTAGE VARIATIONS

Use of solid-state components has greatly extended the

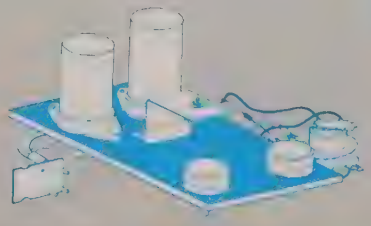
NO ONE ELSE CAN OFFER THIS UNIQUE



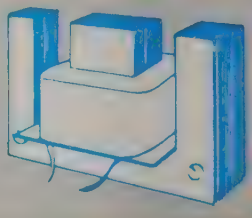
BLUE M VERSATILE DUAL MICROTROL
Versatility adds even more convenience and safety! This sturdily designed, hydraulic type temperature control with dual microswitches automatically selects and repeats any two consistently used temperatures within range.


TYPICAL CROSS SECTION
REMOVABLE STAINLESS STEEL ELEMENTS
ELECTRICAL CONTROL COMPARTMENT
MAGNI-WHIRL AGITATOR PLATE MOVES UP AND DOWN CIRCULATING WATER.
MAGNI-WHIRL ELECTROMAGNET

PACKAGED PLUG-IN SOLID-STATE POWER SUPPLY
Consists of a Resistor-Capacitor network coupled into a unijunction transistor driving an SCR. Magnet coil and power supply unit fully protected by KLIXON bimetal thermostat. All quality components on printed circuit board; easily inspected.



D.C. POWERFUL ELECTROMAGNET
"Sealing Force" of 130 pounds for pulsation of counterweighted agitator plate, provides characteristic MAGNI-WHIRL rocking movement for complete uniformity of circulation. Rugged, powerful and silent.



BLUE M

FEATURING SOLID-STATE DESIGN

voltage range at which these MAGNI-WHIRL models will operate efficiently. You still have an external means to compensate for line voltage variations, but your new MAGNI-WHIRL Baths will operate at peak efficiency with much lower or higher voltages than ever before. Standard 120 volt MAGNI-WHIRL Baths, operating at voltages as low as 105 and up to 130, show practically no deviation in performance. Your local power service may vary, but the performance of your MAGNI-WHIRL Bath doesn't. All models operate equally as well on 50 or 60 Hz.

GREATER RESISTANCE TO AMBIENT TEMPERATURE CHANGE
MAGNI-WHIRL Baths operate efficiently despite normal ambient temperature changes. Baths operating with ambient temperature at +50°C.—considerably higher than can be expected under almost any circumstances—continue to perform almost precisely as in a normal environment. Other models which feature the patented POWER-O-MATIC 70® Solid-State Proportioning Control System for critical performance also feature built-in ambient temperature compensation to assure maximum resistance to even sharp variations in room temperature.

PATENTED MEMORY RING® TEMPERATURE CALIBRATING DIAL
This exclusive Blue M development—long standard on reactor controlled ovens and humidity equipment—is now included on many MAGNI-WHIRL Baths. Makes pin-point calibration of all temperatures easy . . . lets you zero-in on any or all temperatures with potentiometer accuracy—and "remembers" every calibration factor for reproducibility. You get the exact temperature you want every time.

MODERN APPEARANCE
Besides their major engineering and operating changes inside, MAGNI-WHIRL Baths now have a modern appearance outside. A modern epoxy-protected aluminum control panel is recessed. Clear, uncluttered, easy to keep clean, these units complement any laboratory, research or production department.

OPERATING PRINCIPLE!

Automatic, self-timing electromagnet below bottom nonmagnetic wall, periodically pulsates counterweighted rocker agitator plate. Variable, timed rocking of agitator provides complete, gentle, quiet agitation and circulation throughout entire liquid mass, irrespective of how heavily bath is loaded. D. C. electromagnet energized and de-energized by a quality solid-state D. C. "packaged power supply" consisting of a Resistor-Capacitor network coupled into a unijunction transistor driving an SCR. Magnet coil and power supply fully protected by KLIXON® bimetal thermostat. External means of compensation for line voltage variations is provided for unusual operating conditions.

This patented feature is incorporated in a variety of models suitable for every laboratory use and need.

MAGNI-WHIRL—the finest baths you can buy, at any price!

NO ONE ELSE CAN OFFER ALL THESE FEATURES!

UNIFORMITY WITHIN ±0.1°C.

NO MOTORS—EXCLUSIVE PATENTED SYSTEM

NO REPAIRS, OILING OR ADJUSTING

100% ACCESSIBLE AND USABLE WORKING AREAS

STAINLESS INTERIORS AND EXTERIORS. HELI-ARC WELDED

STAINLESS SENSING BULB

SIMPLIFIED OPERATION

RECESSED CONTROL PANELS

PUSH-BUTTON SAFETY RESET SWITCH
Magnet coil and power supply protected by thermostat; touching button plunger resumes operation instantly.

BREAKDOWN TESTED
All baths tested at 1000 V. for 60 seconds.

READY TO OPERATE
With drain, thermometer, and thermometer holder.
Wiring complete and enclosed;
meets N.E. Code as amended.
Line cords on many models, optional on others.

Many models meet ASTM Specifications. A list of these typical standards is shown on pages 182/183.

BLUE M

Magni Whirl®

PATENTED IN U.S.A. AND CANADA

highest quality

Constant Temperature

WATER BATHS

with

POWER-O-MATIC 75®

PATENTED

high gain solid-state proportioning control system, built-in overtemperature protection and constant level water feeder

BUILT-IN OVERTEMPERATURE PROTECTION
Positive safeguard for bath and workload—at no added cost!

BUILT-IN AMBIENT TEMPERATURE COMPENSATION
Liquid temperatures maintained even though room temperature varies!

BUILT-IN LINE VOLTAGE COMPENSATION
Liquid temperatures maintained even though line voltage varies!

SOLID-STATE DESIGN
Eliminates relays in agitation system!

WHISPER SILENCE
Pilot lamp added to denote bath is operating!

VARIABLE PULSE RATE
Agitation determined by you!

ROCKER AGITATOR PLATE
Improves fluid directional flow, can't wear out!

IMMUNE TO VOLTAGE CHANGES
Operates efficiently under wide voltage variations!

12 IN. DEEP MODEL
For those unusual needs!

MEMORY RING® TEMPERATURE CALIBRATING DIAL

MAXIMUM TEMPERATURE OBTAINABLE WITH COVER

DESIGNED FOR YOUR MOST CRITICAL NEEDS! AUTOMATICALLY MAINTAINS TEMPERATURES FROM 5°C. ABOVE AMBIENT TO +100°C. WITHIN ±0.2°C. OR BETTER

By developing this series of baths with proven design, operating and performance features and placing it under control of the exclusive POWER-O-MATIC 75 Solid-State Proportioning System, an advanced modification of the instrumentation described on pages 12 and 13, Blue M is able to offer the scientific and laboratory community a test/processing facility without equal Providing true straight-line temperature control throughout the units' +100°C. range, POWER-O-MATIC 75 maintains temperature uniformity throughout the entire water mass to ±0.2°C. or better.

The patented MAGNI-WHIRL agitation system is now vastly improved to provide faster agitation, greater dependability, longer life, less maintenance. Timing and power relays are eliminated in agitation system . . . operation is silent . . . agitator pulse rate is variable . . . fluid directional flow is improved . . . variations in line voltage can be ignored . . . special ambient temperature compensation built-in. Truly a water bath to meet the strictest requirements!

THE MOST EFFICIENT AGITATION SYSTEM EVER DEVELOPED . . . Built-in, automatic MAGNI-WHIRL circulating system saves the cost, time and space required by conventional stirrers and agitation methods. Now redesigned to include solid-state components to eliminate failure-prone relays in agitation system. New counter-weighted rocker agitator plate is peridoically pulsated by the automatic time energization of a D.C. electromagnet and D.C. solid-state "packaged power supply". Rocking motion of the agitator, factory-set but variable to suit any operating requirement, provides complete, quiet agitation of the liquid.

QUALITY DESIGN AND CONSTRUCTION FEATURES THROUGHOUT . . . Besides these many major improvements, this series of MAGNI-WHIRL BATHS still offers all the quality features of the earlier models: removable stainless steel element assembly; recessed control panel; push-button reset switch to protect magnet and power supply; external means to compensate for line voltage variation of power supply.

EQUIPMENT COVERED BY OUR EXCLUSIVE
PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY
BLUE M
SEE PAGE 16

BLUE M

SEE PAGES 12-13 FOR FULL DESCRIPTION OF PATENTED POWER-O-MATIC 70 CONTROL SYSTEM

GENERAL SPECIFICATIONS AND PRICES

CONSTRUCTION: Double wall; water chamber and outer jacket polished 18-8 stainless, type 304. Heli-arc welded to form a leakproof interior. No welded fittings to receive elements. Welds passivated. Protective feet safeguard work surfaces.

INSULATION: Water chamber blanketed with 1 in. Fiberglas; moisture-proof, will not settle. Thermal conductivity is 0.23.

MAGNI-WHIRL: (Patented)—Automatic, self-timing electromagnet below bottom non-magnetic wall, periodically pulsates counterweighted rocker agitator plate. Variable, timed rocking of agitator provides complete, gentle, quiet agitation and circulation throughout liquid, despite heavy loading. D.C. electromagnet energized and de-energized by solid-state D.C. "packaged power supply" consisting of a Resistor-Capacitor network coupled into a unijunction transistor driving an SCR. External compensation for line voltage variations.

SOLID-STATE PACKAGED POWER SUPPLY: No timing relays—reliable and trouble-free. Magnet coil and power supply protected by KLIXON® thermostat; touch on button plunger repositions bi-metal protector for resumption of normal operation. Quality components on printed circuit board.

CONSTANT WATER LEVEL FEEDER (Strainer Type): Connects to water supply, maintains constant water level in bath at all temperatures irrespective of test time length. Strainer prevents passage of foreign materials.

GLASS THERMOMETER: Laboratory type, mercury in glass. Calibrated—2°C. to +105°C., 24 in. long, graduated 0.1° C. divisions.

BLUE M STAINLESS STEEL ELEMENTS (OVER-THE-TOP): Removable for thorough cleaning of tank. Sheath design, of stainless, type 316L, tubular, with "cold end" terminals. Low watt density for long life.

USABLE AS SEROLOGICAL BATH: Reversing diffuser plate reduces depth of bath to 5 in.—correct for supporting test tube racks.

NEON PILOT LAMPS: Red, denotes unit operation; white shows pulse rate.

DRAIN: Solid brass, brightly nickel-plated drain cock. Rubber hose easily attached if desired.

WIRING: Complete, enclosed at end of bath. Ready for use. Removable cover permits inspection of components. Baths tested one minute at 1000 V., 60 Hz. A.C. Wiring meets N.E. Code, as amended. Terminal box.

Model Number	Full Working Space Inches (Cm.)			Overall Dimensions Inches (Cm.)			Total VA	Voltage 50/60 Hz. A.C. Single Phase	Shipping Weight Lbs. (Kg.)	Approximate Capacity Gal. (L)	Complete Price With OTP
	L.	W.	D.	L.	W.	D.					
MWR-1120A-2	18 (45)	12 (31)	7½ (19)	27 (68)	14 (35)	16 (40)	1600	*120 V.	65 (29)	8.6 (32)	$780.00
MWR-1116C-2	16 (40)	16 (40)	12 (31)	25 (63)	18 (45)	21 (53)	2400	240 V	125 (56)	17.0 (64)	970.00
MWR-1130C-2	30 (76)	12 (31)	7½ (19)	39 (98)	14 (35)	16 (40)	2400	240 V.	88 (40)	14.1 (53)	970.00
MWR-1140C-2	36 (90)	18 (45)	9½ (24)	45 (113)	20 (51)	19 (48)	2750	240 V.	125 (56)	31.1 (117)	1270.00

*Model available for 240 V. or 208 V /1 Ph. We will supply a separate autoformer package having female receptacle, line cord and plug. Simple installation. Specify Part No. E17E-1-2. ..... $120.00 Each
Other models will operate reliably when connected to 208 volt service. A 25% reduction in element power will result

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories

Series Number	Concentric Ring Cover with Concentric Ring Sets			Nickel-Plated Copper Cooling Coil		Removable Solid Gable Cover With Handle		Test Tube Rack Part No. M20-D3 20 Tube Capacity	
	Part Number	Number of Sets Per Cover	Complete Price	Part Number	Complete Price	Part Number	Price Each	Number Per Bath	**Price Each
MWR-1120	M21-C3	6	$118.00	M19-D10	$68.00	M21-A3	$43.00	8	$13.00
MWR-1116	M21-C2	4	92.00	M19-D8	77.00	M21-A2	46.00	7	13.00
MWR-1130	M21-C4	8	152.00	M19-D11	90.00	M21-A5	55.00	12	13.00
MWR-1140	M21-C5	8	208.00	M19-D12	184.00	M21-A7	75.00	21	13.00

**Price applies ONLY when ordered with bath

EXTRA THERMOMETER: As described above. Cat. No. CO1C-2 ..... $27.00 Each

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly.

FOR FULL DESCRIPTION OF THESE AND OTHER ACCESSORIES, SEE PAGES 167-169

BLUE M

Magni Whirl®

PATENTED IN U.S.A. AND CANADA

Constant Temperature

WATER BATHS

SOLID-STATE DESIGN
Eliminates relays in both the control and agitation system!

WHISPER SILENCE
Pilot lamp added to denote bath is operating!

VARIABLE PULSE RATE
Agitation determined by you!

ROCKER AGITATOR PLATE
Improves fluid directional flow, can't wear out!

STAINLESS SENSING BULB

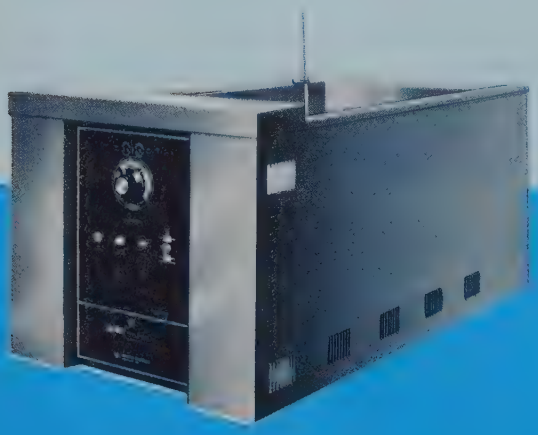
IMMUNE TO VOLTAGE CHANGES
Operates efficiently under wide voltage variations!

GREATER RESISTANCE TO AMBIENT TEMPERATURE CHANGES
Unimpaired efficiency despite them!

12 IN. DEEP MODEL
For those unusual needs!

MEMORY RING® TEMPERATURE CALIBRATING DIAL

PLUS MANY OTHER UNIQUE FEATURES . . . YOURS ONLY FROM BLUE M!



MAXIMUM TEMPERATURE OBTAINABLE WITH COVER

PROVEN IN DESIGN . . . OPERATION . . . APPEARANCE!
AUTOMATICALLY MAINTAINS TEMPERATURES FROM 5°C. ABOVE AMBIENT TO +100°C. WITHIN ±0.2°C. OR BETTER

MODERN SOLID-STATE DESIGN.
NO RELAYS, SILENT, TROUBLE-FREE!
RE-ENGINEERED FOR GREATER RELIABILITY!

The patented MAGNI-WHIRL agitation system is now vastly improved to provide faster agitation, greater dependability, longer life, less maintenance. Timing and power relays are eliminated in both the control and agitation systems . . . operation is silent . . . agitator pulse rate is variable . . . fluid directional flow is improved . . . variations in line voltage and ambient temperature can be ignored. These plus many other exclusive Blue M features are all encased in a completely redesigned all-stainless housing combining beauty and functional utility.

THE MOST EFFICIENT AGITATION SYSTEM EVER DEVELOPED . . . Built-in, automatic, MAGNI-WHIRL circulating system saves the cost, time and space required by conventional stirrers and agitation methods. Now redesigned to include solid-state components to eliminate failure-prone relays in control circuit and agitation system. New counterweighted rocker agitator plate is periodically pulsated by the automatic time energization of a D.C. electromagnet and D.C. solid-state "packaged power supply". Rocking motion of the agitator, factory-set but variable to suit any operating requirement, provides complete, quiet agitation of the liquid. Temperature is uniform thoughout the entire water mass to ±0.2°C. or better.

QUALITY DESIGN AND CONSTRUCTION FEATURES THROUGHOUT . . . Besides these many major improvements this series of MAGNI-WHIRL BATHS still offers all the quality features of the earlier models: removable stainless steel element assembly; recessed control panel; push-button reset switch to protect magnet and power supply; external means to compensate for line voltage variation of power supply.

MAXIMUM OPERATIONAL CONVENIENCE . . . Blue M Automatic Dual Microtrol selects and repeats your two most used temperatures. Underwriters' Laboratories, Inc. listed.

UL

Guide No. 165E9
File No. E30112

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY

SEE PAGE 10

BLUE M

GENERAL SPECIFICATIONS AND PRICES

CONSTRUCTION: Double wall—water chamber and outer jacket polished stainless, type 304. Heli-arc welded to form a tight, leakproof interior. No welded fittings to receive elements. Welds passivated. Protective feet safeguard work surfaces.

INSULATION: Water chamber blanketed with 1 in. Fiberglas; moisture-proof, will not settle. Thermal conductivity is 0.23.

MAGNI-WHIRL: (Patented)—Automatic, self-timing electromagnet below bottom non-magnetic wall, periodically pulsates counterweighted rocker agitator plate. Variable, timed rocking of agitator provides complete, gentle, quiet agitation and circulation throughout liquid, despite heavy loading. D.C. electromagnet energized and de-energized by a solid-state D.C. "packaged power supply" consisting of a Resistor-Capacitor network coupled into a unijunction transistor driving an SCR. External compensation for line voltage variations.

SOLID-STATE PACKAGED POWER SUPPLY: No timing relays—reliable and touble-free. Magnet coil and power supply protected by KLIXON® thermostat; touch on button plunger repositions bi-metal protector for resumption of normal operation. Quality components on printed circuit board.

GLASS THERMOMETER: Laboratory type, mercury in glass. Calibrated—10°C. to +110°C., 13 in. long, graduated 1°C. divisions.

BLUE M STAINLESS STEEL ELEMENTS (OVER-THE-TOP): Removable for thorough cleaning of tank. Sheath design, of stainless, type 316L, tubular, with "cold end" terminals. Low watt density, not affected by low temperatures.

USABLE AS SEROLOGICAL BATH: Reversing diffuser plate reduces depth of bath to 5 in.—correct for test tube racks

AUTOMATIC DUAL MICROTROL: Hydraulic type, automatic temperature control with dual microswitches. Stainless sensing bulb. Contacts totally enclosed, U.L. Listed. Permits selection of any two temperatures most used, but all temperatures within range may also be used without changing the two settings.

SOLID-STATE EVER-CYCLE SWITCHING CIRCUIT: SCR permits control of high wattage heating elements by very low current through the microswitches. Eliminates relays and moving parts . . . extends microswitch life . . . greatly improves reliability. Quiet, safe, sure!

NEON PILOT LAMPS (2): Amber, denotes elements are energized; white shows pulse rate.

DRAIN: Each bath fitted with solid brass, brightly nickel-plated drain cock for convenient draining of bath.

WIRING: Complete, enclosed at end of bath. Ready for use. Removable cover permits inspection of components. Baths tested one minute at 1000 V., 60 Hz. Wiring meets N.E. Code, as amended. Six foot rubber cord, three wire plug and strain relief provided for Model MW-1110A-1. Others have terminal boxes.

Model Number	Full Working Space Inches (Cm.) L.	W.	D.	Overall Dimensions Inches (Cm.) L.	W.	D.	Approximate Capacity Gal. (L)	Maximum Watts	Voltage 50/60 Hz. A.C. Single Phase	Shipping Weight Lbs. (Kg.)	Complete Price
MW-1110A-1	12 (31)	7½ (19)	7½ (19)	21 (53)	10 (25)	16 (40)	3.5 (13)	800	*120 V.	50 (22)	$290.00
MW-1120A-1 MW-1120C-1	18 (45)	12 (31)	7½ (19)	27 (68)	14 (35)	16 (40)	8.6 (32)	1600	120 V. **240 V.	60 (27)	460.00
MW-1116C-1	16 (40)	16 (40)	12 (31)	25 (63)	18 (45)	21 (53)	17.0 (64)	2400	**240 V.	120 (54)	625.00
MW-1130A-1 MW-1130C-1	30 (76)	12 (31)	7½ (19)	39 (98)	14 (35)	16 (40)	14.1 (53)	2400	120 V. **240 V.	80 (36)	625.00
MW-1140A-1 MW-1140C-1	36 (90)	18 (45)	9½ (24)	45 (113)	20 (51)	19 (48)	31.1 (117)	2750	120 V. **240 V.	120 (54)	880.00

*Model MW-1110A-1 available also for 240 V or 208 V./1 Ph. We will supply a separate autoformer package having female receptacle, line cord and plug. Simple installation
Specify Part No. E17E-1-1 ..... $90.00 Each

**These models will operate reliably when connected to 208 volt service. A 25% reduction in element power will result

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories

Series Number	Removable Solid Gable Cover With Handle Part Number	Price Each	Concentric Ring Cover with Concentric Ring Sets Part Number	Number of Sets Per Cover	Complete Price	Nickel-Plated Copper Cooling Coil Part Number	Complete Price	Test Tube Rack Part No. M20-D3 20 Tube Capacity Number Per Bath	**Price Each
MW-1110	M21-A1	$34.00	M21-C1	2	$49.00	M19-D5	$39.00	3	$13.00
MW-1120	M21-A3	43.00	M21-C3	6	118.00	M19-D10	68.00	8	13.00
MW-1116	M21-A2	46.00	M21-C2	4	92.00	M19-D-8	77.00	7	13.00
MW-1130	M21-A5	55.00	M21-C4	8	152.00	M19-D11	90.00	12	13.00
MW-1140	M21-A7	75.00	M21-C5	8	208.00	M19-D12	184.00	21	13.00

**Price applies ONLY when ordered with bath

EXTRA THERMOMETERS: As described above.
Part No. CO1C-6 ..... $10.00 Each

CONSTANT WATER LEVEL FEEDER:
Cat. No. JA-O-01 ..... $78.00 Installed

BLUE M OVERTEMPERATURE PROTECTION: Safeguards workload and equipment. For all models.
Specify Part No. CO8A-3-27 ..... 120.00 Installed

FOR FULL DESCRIPTION OF THESE AND OTHER ACCESSORIES, SEE PAGES 167-169

BLUE M

Magni Whirl®

PATENTED IN U.S.A. AND CANADA

High Powered Constant Temperature WATER BATHS

with

built-in overtemperature protection and constant water level feeder

TEMPERATURE RANGE
5°C. above ambient to +100°C. (+212°F.)
(Maximum temperature obtainable with cover supplied with bath)

RUN-UP TIME (No Load)
To +90°C. (Small size)
Approx. 1¾ hr.
To +90°C. (Large size)
Approx. 3¾ hr.

CONTROL ACCURACY
±0.5°C.

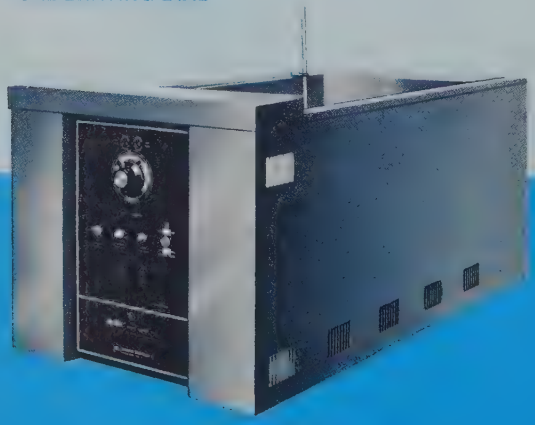
SETABILITY
±1.0°C.

TYPICAL LIQUID UNIFORMITY
At +65°C.: ±0.7°C.

TEMPERATURE DRIFT
Over 24-hr. period: ±0.5°C.

SOLID-STATE DESIGN
Eliminates relays in both the control and agitation system!

MEMORY RING® TEMPERATURE CALIBRATING DIAL



A SUPERIOR ABOVE-AMBIENT TEST/ PROCESSING FACILITY WITH FAST RUN-UP CAPABILITIES

The unusually high K.W. rating of these MAGNI-WHIRL Baths has enabled Blue M to offer the scientific and laboratory field two proven units with uniquely efficient, fast temperature run-up characteristics. Supplementing this short-test advantage is a constant water level feeder which automatically maintains the liquid level as desired—a valuable feature if the bath is to be operated unattended at high temperatures over long periods. Blue M's exclusive Dual Microtrol Control working in conjunction with the patented Memory Ring® Temperature Calibrating Dial maintains temperatures within ±0.5°C. or better throughout the range . . . assures easy repeatability of desired temperatures in the future. Built-in overtemperature protection safeguards bath and workload at all times.

MODERN SOLID-STATE DESIGN. NO RELAYS, SILENT, TROUBLE-FREE! RE-ENGINEERED FOR GREATER RELIABILITY!

These baths also feature the quietest, most efficient agitation system ever developed. There are no motors or stirrers. Built-in, automatic MAGNI-WHIRL circulating system saves the cost, time and space required by conventional stirrers and agitation methods. Counterweighted rocker agitator plate is periodically pulsated by the automatic time energization of a D.C. electromagnet and D.C. solid-state "packaged power supply." Rocking motion of the agitator, factory-set but variable to suit any operating requirement, provides complete, quiet agitation of the liquid. Units also offer all the quality design and construction features of other MAGNI-WHIRL Baths.

Similar baths for applications where the high performance capabilities of these units are not required are shown on the preceding pages.

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY

SEE PAGE 16

BLUE M

GENERAL SPECIFICATIONS AND PRICES

CONSTRUCTION: Double wall—water chamber and outer jacket polished 18-8 stainless, type 304. Heli-arc welded to form a tight, leakproof interior. No welded fittings to receive elements. Welds passivated. Protective feet safeguard work surfaces.

INSULATION: Water chamber blanketed with 1 in. Fiberglas; moisture-proof, will not settle. Thermal conductivity is 0.23.

COVER: Solid gable, stainless, with handle. Removable.

MAGNI-WHIRL: (Patented)—Automatic, self-timing electromagnet below bottom non-magnetic wall, periodically pulsates counterweighted rocker agitator. Variable rocking of agitator provides complete, gentle, quiet agitation and circulation of liquid, despite heavy loading. D.C. electromagnet energized and de-energized by a solid-state D.C. "packaged power supply" consisting of a Resistor-Capacitor network coupled into a unijunction transistor driving an SCR. External compensation for line voltage variations.

SOLID-STATE PACKAGED POWER SUPPLY: No timing relays—reliable, trouble-free. Magnet coil and power supply protected by KLIXON® thermostat; touch on button repositions bi-metal protector for resumption of normal operation. Quality components on printed circuit board.

GLASS THERMOMETER: Laboratory type, mercury in glass. Calibrated—10°C. to +110°C., 12 in. long, graduated 1°C. divisions.

BLUE M STAINLESS STEEL ELEMENTS (OVER-THE-TOP): Removable for thorough cleaning of tank. Sheath design, of stainless, type 316L, tubular, with "cold end" terminals. Low watt density, not affected by low temperatures.

AUTOMATIC DUAL MICROTROL: Hydraulic, automatic control with dual micro-switches. Stainless sensing bulb. Contacts enclosed, U.L. Listed. Permits selection of two temperatures most used, but all temperatures may be used without changing two routine settings.

OVERTEMPERATURE PROTECTION: Exclusive Blue M independent direct line system provides positive safety for both workload and bath.

SOLID-STATE EVER-CYCLE SWITCHING CIRCUIT: SCR permits control of high wattage heating elements by very low current through the microswitches. Eliminates relays and moving parts . . . extends microswitch life . . . greatly improves reliability. Quiet, safe, sure! Large model uses two SCR switching devices.

NEON PILOT LAMPS (2): Amber, denotes elements are energized; white shows pulse rate.

DRAIN: Each bath fitted with solid brass, brightly nickel-plated drain cock for convenient draining of bath.

WIRING: Complete, enclosed at end of bath. Ready for use. Removable cover permits inspection of components. Baths tested one minute at 1000 V., 60 Hz. Wiring meets N.E. Code, as amended. Terminal box.

Number Model	Full Working Space Inches (Cm.)			Overall Dimensions Inches (Cm.)			Approximate Capacity Gal. (L)	Total KVA	Voltage 50/60 Hz. A.C. Single Phase	Shipping Weight Lbs. (Kg.)	Complete Price With OTP
	L.	W.	D.	L.	W.	D.					
MW-1120C-1HP	18 (45)	12 (31)	7½ (19)	27 (68)	14 (35)	16 (40)	8.6 (32)	3.2	*240 V.	70 (32)	$870.00
MW-1140C-1HP	36 (90)	18 (45)	9½ (24)	45 (113)	20 (51)	19 (48)	31.1 (117)	5.5	*240 V.	130 (59)	1390.00

*These models will operate reliably when connected to 208-volt service. A 25% reduction in element power will result and will obviously increase slightly required time to reach elevated temperatures

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories

Model Number	Concentric Ring Cover with Concentric Ring Sets			Nickel-Plated Copper Cooling Coil		Test Tube Rack Part No. M20-D3 20 Tube Capacity	
	Part Number	Number of Sets Per Cover	Complete Price	Part Number	Complete Price	Number Per Bath	**Price Each
MW-1120C-1HP	M21-C14	6	$120.00	M19-D10	$68.00	8	$13.00
MW-1140C-1HP	M21-C15	8	210.00	M19-D12	184.00	21	13.00

**Price applies ONLY when ordered with bath

EXTRA THERMOMETERS:
As described above. Cat. No. CO1C-6 ..... $10.00 Each

FOR FULL DESCRIPTION OF THESE AND OTHER ACCESSORIES, SEE PAGES 167-169

BLUE M

Magni Whirl®

PATENTED IN U.S.A. AND CANADA

fast setting

Constant Temperature

WATER BATHS

with **QUICK-SET MERCURY THERMOREGULATOR AND SOLID-STATE SWITCHING CIRCUIT**
Actual Control: ±0.025°C. or better.
Overall Uniformity: ±0.1°C. or better (within 1 in. of walls and 1½ in. of elements).

plus **AUTOMATIC DUAL MICROTROL WHICH ACTS AS SAFETY CONTROL**

SOLID-STATE DESIGN
Eliminates relays in both the control and agitation system!

WHISPER SILENCE
Pilot lamp added to denote bath is operating!

VARIABLE PULSE RATE
Agitation determined by you!

ROCKER AGITATOR PLATE
Improves fluid directional flow, can't wear out!

STAINLESS SENSING BULB

IMMUNE TO VOLTAGE CHANGES
Operates efficiently under wide voltage variations!

GREATER RESISTANCE TO AMBIENT TEMPERATURE CHANGES
Unimpaired efficiency despite them!

12 IN. DEEP MODEL
For those unusual needs!

MEMORY RING® TEMPERATURE CALIBRATING DIAL AIDS PRELIMINARY TEMPERATURE SELECTION

MAXIMUM TEMPERATURE OBTAINABLE WITH COVER

PROVEN IN DESIGN . . . OPERATION . . . APPEARANCE!
FASTER SETTING OF PRECISE TEMPERATURE
AUTOMATICALLY MAINTAINS TEMPERATURE FROM 5°C. ABOVE AMBIENT TO +100°C.

MODERN SOLID-STATE DESIGN.
NO RELAYS, SILENT, TROUBLE-FREE!
RE-ENGINEERED FOR GREATER RELIABILITY!

The patented MAGNI-WHIRL agitation system is now vastly improved to provide faster agitation, greater dependability, longer life, less maintenance. Timing and power relays are eliminated in both the control and agitation systems . . . operation is silent . . . agitator pulse rate is variable . . . fluid directional flow is improved . . . variations in line voltage and ambient temperature can be ignored. These plus many other exclusive Blue M features are all encased in a completely redesigned all-stainless housing combining beauty and functional utility.

THE MOST EFFICIENT AGITATION SYSTEM EVER DEVELOPED . . . Built-in, automatic MAGNI-WHIRL circulating system saves the cost, time and space required by conventional stirrers and agitation methods. Now redesigned to include solid-state components to eliminate failure-prone relays in control circuit and agitation system. New counterweighted rocker agitator plate is periodically pulsated by the automatic energization of a D.C. electromagnet and D.C. solid-state "packaged power supply". Rocking motion of the agitator, factory-set but variable to suit any operating requirement, provides complete, quiet agitation of the liquid. Temperature is uniform throughout the entire water mass to ±0.1°C. or better.

QUALITY DESIGN AND CONSTRUCTION FEATURES THROUGHOUT . . . Besides these many major improvements, this series of MAGNI-WHIRL BATHS still offer all the quality features of the earlier models: removable stainless steel element assembly; recessed control panel; pushbutton reset switch to protect magnet and power supply; external means to compensate for line voltage variation of power supply.

MAXIMUM OPERATIONAL CONVENIENCE . . . Blue M Automatic Dual Microtrol can be used to select and repeat your two most used temperatures when not serving as back-up safety control. Underwriters' Laboratories, Inc. listed.

EQUIPMENT COVERED BY OUR EXCLUSIVE
PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

BLUE M

GENERAL SPECIFICATIONS AND PRICES

CONSTRUCTION: Double wall—water chamber and outer jacket of polished stainless, type 304. Heli-arc welded to form tight, leakproof interior. No welded fittings to receive elements. Welds passivated. Protective feet safeguard work surfaces.

INSULATION: Water chamber blanketed with 1 in. of Fiberglas which is moisture-proof and will not settle. Thermal conductivity is 0.23.

AUTOMATIC DUAL MICROTROL: Hydraulic type, automatic temperature control with dual microswitches. Contacts totally enclosed and U.L. Listed. Permits selection of any two temperatures frequently used, if need be, when not functioning as back-up safety control.

QUICK-SET MERCURY THERMOREGULATOR: 0°C. to +100°C., used for greater sensitivity and finer degree of temperature control. Adjustment knob permits rapid setting. Control point quickly made, furnished with rotating adjusting magnet. Tungsten to mercury contact design is compact and self-contained.

Bath temperature can be maintained by either Dual Microtrol or by Mercury Thermoregulator. Thermoregulator with its greater sensitivity is generally used to maintain bath temperature while Microtrol set at slightly higher temperature will automatically take over control should Thermoregulator circuit failure occur.

SOLID-STATE EVER-CYCLE SWITCHING CIRCUIT: SCR permits control of high wattage heating elements with very low current through the thermoregulator. Eliminates relays and moving parts . . . extends life . . . greatly improves reliability. Quiet, safe, sure!

MAGNI-WHIRL: (Patented)—Automatic, self-timing electromagnet below bottom non-magnetic wall, periodically pulsates counterweighted rocker agitator plate. Variable, timed rocking of agitator provides complete, gentle, quiet agitation and circulation throughout liquid, despite heavy loading. D.C. electromagnet energized and de-energized by a quality solid-state D.C. "packaged power supply" consisting of a Resistor-Capacitor network coupled into a unijunction transistor driving an SCR. External compensation for line voltage variations.

SOLID-STATE PACKAGED POWER SUPPLY: No timing relays—reliable and trouble-free. Magnet coil and power supply protected by KLIXON® thermostat; touch on button plunger repositions bi-metal protector for resumption of normal operation. Quality components on printed circuit board.

BLUE M STAINLESS STEEL ELEMENTS (OVER-THE-TOP): Removable for thorough cleaning of tank. Sheath design, of stainless, type 316L, tubular, with "cold end" terminals. Low watt density for long life.

NEON PILOT LAMPS (2): Amber, denotes elements are energized; white shows pulse rate.

GLASS THERMOMETER: Meets National Bureau of Standards specifications. Extremely precise. Calibrated—2°C. to +105°C. in 0.1°C. divisions, 24 in. long. Stainless bracket.

WIRING: Complete and enclosed at end of bath. Ready for use. Removable cover permits inspection of components. Baths tested one minute at 1000 V., 60 Hz. Wiring meets N.E. Code, as amended. Terminal boxes.

Model Number	Full Working Space Inches (Cm.)			Overall Dimensions Inches (Cm.)			Approximate Capacity Gal. (L)	Total VA	Voltage 50/60 Hz. A.C. Single Phase	Shipping Weight Lbs. (Kg.)	Complete Price
	L.	W.	D.	L.	W.	D.					
MW-1210A-1	12 (31)	7½ (19)	7½ (19)	21 (53)	10 (25)	16 (40)	3.5 (13)	830	*120 V.	65 (29)	$630.00
MW-1220A-1 MW-1220C-1	18 (45)	12 (31)	7½ (19)	27 (68)	14 (35)	16 (40)	8.6 (32)	1630	120 V. **240 V.	75 (34)	760.00
MW-1216C-1	16 (40)	16 (40)	12 (31)	25 (63)	18 (45)	21 (53)	17.0 (64)	2435	**240 V.	120 (54)	980.00
MW-1230A-1 MW-1230C-1	30 (76)	12 (31)	7½ (19)	39 (98)	14 (35)	16 (40)	14.1 (53)	2435	120 V. **240 V.	85 (38)	980.00
MW-1240A-1 MW-1240C-1	36 (90)	18 (45)	9½ (24)	45 (113)	20 (51)	19 (48)	31.1 (117)	2790	120 V. **240 V.	125 (56)	1165.00

**These models will operate reliably when connected to 208 volt service. A 25% reduction in element power will result.
*Model MW-1210A-1 available also for 240 V. or 208 V./1 Ph. We will supply a separate autoformer package having female receptacle, line cord and plug. Simple installation.

Specify Part No. E17E-1-1 . . $80.00 Each

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories.

Series Number	Removable Solid Gable Cover with Handle		Concentric Ring Cover with Concentric Ring Sets			Nickel-Plated Copper Cooling Coil		Test Tube Rack Part No. M20-D3 20 Tube Capacity	
	Part Number	Price Each	Part Number	Number of Sets Per Cover	Complete Price	Part Number	Complete Price	Number Per Bath	**Price Each
MW-1210	M21-A11	$42.00	M21-C6	2	$50.00	M19-D5	$39.00	3	$13.00
MW-1220	M21-A13	53.00	M21-C8	6	120.00	M19-D10	68.00	8	13.00
MW-1216	M21-A12	56.00	M21-C7	4	94.00	M19-D8	77.00	7	13.00
MW-1230	M21-A14	62.00	M21-C9	8	154.00	M19-D11	90.00	12	13.00
MW-1240	M21-A15	86.00	M21-C10	8	212.00	M19-D12	184.00	21	13.00

*Price applies ONLY when ordered with bath

BLUE M OVERTEMPERATURE PROTECTION: Safeguards workload and equipment. For all models.
Specify Part No. CO8A-3-27 . . . . . $120.00 Installed

EXTRA THERMOMETER: As described above.
Part No. CO1C-2 . . . . . $27.00 Each

CONSTANT WATER LEVEL FEEDER:
Cat. No. JA-0-01 . . . . . $78.00 Installed

FOR FULL DESCRIPTION OF THESE AND OTHER ACCESSORIES, SEE PAGES 167-169.

BLUE M

Magni Whirl®

PATENTED IN U.S.A. AND CANADA

Constant Temperature SHAKER BATHS

3 DISTINCT MODELS
New large size for high volume work.

SOLID-STATE DESIGN
Eliminates relays in both the control and agitation system!

VARIABLE PULSE RATE
Agitation determined by you!

ROCKER AGITATOR PLATE
Improves fluid directional flow, can't wear out!

STAINLESS SENSING BULB

IMMUNE TO VOLTAGE CHANGES
Operates efficiently under wide voltage variations!

GREATER RESISTANCE TO AMBIENT TEMPERATURE CHANGES
Unimpaired efficiency despite them!

UNIFORMITY: ±0.2°C. or better
Throughout Both Ranges!

MEMORY RING® TEMPERATURE CALIBRATING DIAL

2 STANDARD MODELS
Temperature Range
5°C. Above ambient to +100°C.
(Maximum temperature obtainable with cover)

REFRIGERATED
Temperature Range
0°C. to +100°C.

A SHAKER BATH . . . A UTILITY WATER BATH . . . ALL IN ONE! 10-200 STROKES/MINUTE—VARIABLE STROKE: 0" TO 1-15/16"

UNIQUE FLEXIBILITY, EFFICIENCY AND RELIABILITY—NOW ENHANCED WITH NEW LARGE MODEL

Use these quality Shaker Baths for the immersed agitation of flasks, test tubes and similar containers . . . for controlled shaking without liquid . . . as a water bath without shaking. Positive, fingertip speed adjustment varies oscillation/minute from 10-200 on small models and from 10-150 on large. Speeds fully reproducible. Stroke length quickly varied from 0" to 1-15/16" . . . easily duplicated. Stainless shaker carriage glides on nylon rollers . . . is quickly removed when unit is to be used as a water bath without shaking. New large model comes complete with two stainless trays designed to accommodate optional flask holders.

MODERN SOLID-STATE DESIGN . . . NO RELAYS, SILENT, TROUBLE-FREE!
The patented MAGNI-WHIRL agitation system is now vastly improved to provide faster agitation, greater dependability, longer life, less maintenance. Timing relays are eliminated . . . operation is silent . . . agitator pulse rate is variable . . . fluid directional flow is improved . . . variations in line voltage and ambient temperature can be ignored.

THE MOST EFFICIENT AGITATION SYSTEM EVER DEVELOPED . . . Built-in, automatic MAGNI-WHIRL circulating system saves the cost, time, and space required by conventional stirrers and agitation methods. New counterweighted rocker agitator plate is periodically pulsated by the automatic time energization of a D.C. electromagnet and D.C. solid-state "packaged power supply". Rocking motion of the agitator, factory-set but variable to suit any operating requirement, provides complete, quiet agitation to the liquid. Temperature is uniform throughout the entire water mass to ±0.2°C. or better.

QUALITY DESIGN AND CONSTRUCTION FEATURES THROUGHOUT . . . Besides these many major improvements, this series of MAGNI-WHIRL BATHS also offers removable stainless steel element assembly; recessed control panel; pushbutton reset switch to protect magnet and power supply; external means to compensate for line voltage variation of power supply.

EQUIPMENT COVERED BY OUR EXCLUSIVE
PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

BLUE M

GENERAL SPECIFICATIONS AND PRICES

CONSTRUCTION: Double wall—water chamber and outer jacket polished 18-8 stainless, type 304. Heli-arc welded to form a tight leakproof interior. Welds passivated.

INSULATION: Water chamber blanketed with 1 in. Fiberglas.

BLUE M STAINLESS STEEL ELEMENTS (OVER-THE-TOP): Removable for efficient tank cleaning. No welded fittings to receive elements. Sheath design, of stainless, type 316L, tubular, with "cold-end" terminals. Low watt density.

AUTOMATIC DUAL MICROTROL: Hydraulic type, automatic temperature control with dual microswitches. Contacts enclosed, U.L. Listed. Stainless sensing bulb. Permits selection of any two temperatues most used, but all may be used without changing two routine settings.

DRAIN: Solid brass, brightly nickel-plated drain cock.

WIRING: Complete, enclosed. Removable cover permits inspection. Baths tested one minute at 1000 V., 60 Hz. Wiring meets amended N.E. Code. Terminal box.

MAGNI-WHIRL: (Patented)—Automatic, self-timing electromagnet below bottom non-magnetic wall, periodically pulsates counterweighted rocker agitator. Variable, agitator rocking provides complete, gentle, liquid agitation and circulation, despite heavy loading. D.C. electromagnet energized and de-energized by solid-state D.C. "packaged power supply" consisting of a Resistor-Capacitor network coupled into a unijunction transistor driving an SCR.

SOLID-STATE PACKAGED POWER SUPPLY: No timing relays—reliable and trouble-free. Magnet coil and power supply protected by KLIXON® thermostat; touch on button repositions bi-metal protector for resumption of operation.

DIAL THERMOMETER: All stainless. Range to match unit.

SOLID-STATE EVER-CYCLE SWITCHING CIRCUIT: SCR controls high wattage elements by very low current through microswitches. Eliminates relays and moving parts . . . extends microswitch life . . . greatly improves reliability.

NEON PILOT LAMPS (2): Amber denotes elements are energized; white shows pulse rate. Model MSB-3222A-1 has blue lamp to show when compressor is in use.

MECHANICAL CONSTANT-FLOW REFRIGERATION SYSTEM—(On Model MSB-3222A-1 Only). Refrigerant 12 hermetically sealed compressor, fan cooled condenser, refrigerant dryer and expansion valve metering system. Bright nickel-plated copper cooling coil. Quality components for long, quiet, trouble-free service—in polished stainless cabinet. Tested to assure gas-tight system.

BLUE M SHAKER MECHANISM:
MOTOR—Quality design, fully enclosed, variable speed with built-in speed selector.

SHAKER CARRIAGE: welded stainless on Nylon rollers. Easily removed. Clamps hold racks and trays firmly.

CAM—eccentric design, on motor shaft. Long-life bearings in cam and linkage arm.

Model Number	Working Space Without Shaker Inches (Cm.) L.	W.	D.	Overall Dimensions Inches (Cm.) L.	W.	D.	Approximate Capacity Gal. (L)	Heater and Compressor Total VA	Voltage 50/60 Hz. A.C. Single Phase	Shipping Weight Lbs. (Kg.)	Complete Price
MSB-1122A-1 (STANDARD)	18 (45)	12 (31)	7½ (19)	29 (73)	15 (38)	16 (40)	8.5 (31)	1600	*120	125 (56)	$998.00
MSB-1140C-1 (STANDARD)	36 (90)	18 (45)	9½ (22)	48 (120)	21 (53)	19 (48)	31.1 (117)	2750	†240 V.	150 (68)	1695.00
**MSB-3222A-1 (REFRIGERATED)	18 (45)	12 (31)	7½ (19)	29 (73)	28 (70)	17 (43)	8.5 (31)	2000	*120	150 (68)	1775.00

*Units available for 240 V. and 208 V./1 Ph. We will supply a separate autoformer package complete with line cord and plug. Simple installation Specify Part No. E17E-1-2 ..... $120.00 Each
†This model will operate reliably when connected to 208 volt service. A 25% reduction in element power will result
**Unit rated: 1.6 (Heater K W), 1/5 H P (Refrig)

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

TEST TUBE RACKS: Polished stainless, designed for simple loading/unloading. 10" L. x 2 1/16" W. x 5 7/16" H. Small baths hold six. Large model holds 12 in Test Tube Rack Tray described below. Two types:
Part No. M20-D2: Holds eight 25 mm. or 1" dia. test tubes ..... $13.00 Each
Lots of six ..... $11.50 Each
Part No. M20-D4: Holds twenty 4" x ½" (12 mm.) tubes in two rows ..... $13.00 Each
Lots of six ..... $11.50 Each

TEST TUBE RACK TRAY: Required for Model MSB-1140C-1 when used with Test Tube Racks. Holds 12 each of either Racks M20-D2 or M20-D4 above. Stainless.
Specify Part No. M20-B6 ..... $108.00 Each

REMOVABLE SOLID GABLE COVER WITH HANDLE: Prevents evaporation and condensation dripping into tubes. Polished 18-8, type 304 stainless. Clears flasks and tubes up to 213 mm. high.
For MSB-1122A-1: Part No. M21-A8 ..... $57.00 Each
For MSB-1140C-1: Part No. M21-A19 ..... $87.00 Each
For MSB-3222A-1: Part No. M21-A9 ..... $59.00 Each

GASSING HOOD: Fits over shaker portion of bath, and moves with it. Connection accommodates ¼" rubber hose. Flange extends below liquid level to retain gas atmosphere. Type 304 Stainless.
For Models MSB-1122A-1 and MSB-3222A-1, Specify Part No. M21-A10 ..... $55.00 Each
For Model MSB-1140C-1, Specify Part No. M21-A22 ..... $99.00 Each

BLUE M OVERTEMPERATURE PROTECTION: Safeguards workload and equipment. For all models.
Specify Part No. CO8A-3-27 ..... $120.00 Installed

FLASK TRAYS*: Polished stainless, with sturdy handles.
Part No. M20-B2—holds twenty 25 ml. or twelve 50 ml. flasks. 6¾" L. x 9½" W. Bath holds two ..... $28.00 Each
Part No. M20-B3—holds seven 125 ml. or five 250 ml. flasks. 6¾" L. x 9½" W. Bath holds two ..... $28.00 Each
Part No. M20-B4—holds six 500 ml. or three 1000 ml. flasks. 13½" L. x 9½" W. Bath holds one ..... $36.00 Each

FLASK HOLDERS: Nickel-plated phosphor bronze. Spring clip design grips flasks firmly, prevents damage and noise.
Part No. M20-C1—for 10 ml. flask ..... $5.75 Each
Part No. M20-C2—for 25 ml. flask ..... $5.75 Each
Part No. M20-C3—for 50 ml. flask ..... $6.00 Each
Part No. M20-C4—for 125 ml. flask ..... $6.50 Each
Part No. M20-C5—for 250 ml. flask ..... $6.75 Each
Part No. M20-C6—for 500 ml. flask ..... $6.75 Each
Part No. M20-C7—for 1000 ml. flask ..... $7.00 Each

*Model MSB-1140C-1 comes with two stainless Flask Holder Trays which accommodate the above Flask Holders as follows: (200) M20-C1; (112) M20-C2; (104) M20-C3; (50) M20-C4; (36) M20-C5; (28) M20-C6; (18) M20-C7. To order additional Flask Holder Trays,
Specify Part No. M20-B5 ..... $49.00 Each

DIFFUSER RACK: For use when shaker mechanism is removed. Wire rod, electropolished stainless.
For models MSB-1122A-1 and MSB-3222A-1, Specify Part No. MO4-A124 ..... $19.00 Each
For Model MSB-1140C-1, Specify Part No. MO4-A132 ..... $60.00 Each

BLUE M

Magni Whirl®

PATENTED IN U.S.A. AND CANADA

full visibility

Constant Temperature

JAR (PYREX brand glass) BATHS

SOLID-STATE DESIGN AGITATION SYSTEM
Eliminates relays in agitation system!

WHISPER SILENCE
Pilot lamp added to denote bath is operating!

VARIABLE PULSE RATE
Agitation determined by you!

IMMUNE TO VOLTAGE CHANGES
Operates efficiently under wide voltage variations!

GREATER RESISTANCE TO AMBIENT TEMPERATURE CHANGES
Unimpaired efficiency despite them!

TEMPERATURE RANGE
5°C. ABOVE AMBIENT TO +100°C.
(Maximum temperature obtainable with cover)

CONSTANT UNIFORMITY ±0.1°C. or better.

STAINLESS SENSING BULB

MEMORY RING® TEMPERATURE CALIBRATING DIAL

PROVEN IN DESIGN . . . OPERATION . . . PERFORMANCE!
A PROVEN CONCEPT OF VISIBILITY PLUS 99.9% WORKING AREA WITHOUT OBSTRUCTIONS

MODERN SOLID-STATE DESIGNED PACKAGED POWER SUPPLY . . . SILENT. TROUBLE-FREE! RE-ENGINEERED FOR GREATER RELIABILITY!

The patented MAGNI-WHIRL agitation system is now vastly improved to provide faster agitation, greater dependability, longer life, less maintenance. Timing and power relays are eliminated in agitation system . . . operation is silent . . . agitator pulse rate is variable . . . fluid directional flow is improved . . . variations in line voltage and ambient temperature can be ignored.

THE MOST EFFICIENT AGITATION SYSTEM EVER DEVELOPED . . . Built-in, automatic MAGNI-WHIRL circulating system saves the cost, time, and space required by conventional stirrers and agitation methods. Counterweighted rocker agitator plate is periodically pulsated by the automatic time energization of a D.C. electromagnet and D.C. solid-state "packaged power supply" located in the polished stainless base compartment. Rocking motion of the agitator, factory-set but variable to suit any operating requirement, provides complete, quiet agitation of the liquid. Jar is easily cleaned since control compartment and element assembly are removable instantly as a complete unit. Merely disconnect cord and socket/plug assembly.

QUALITY DESIGN AND CONSTRUCTION FEATURES THROUGHOUT . . . Besides these many major improvements, this series of MAGNI-WHIRL BATHS still offers all the quality features of the earlier models: removable stainless steel element assembly; recessed control panel; push-button reset switch to protect magnet and power supply; external means to compensate for line voltage variation of power supply.

MAXIMUM OPERATIONAL CONVENIENCE . . . Blue M Automatic Dual Microtrol selects and repeats your two most used temperatures.

THE MOST EFFICIENT BATH FOR ASTM KINEMATIC VISCOSITY TESTS, MEDICAL AND CLINCIAL USE, GENERAL LABORATORY SERVICE.

UL®

Guide No. 165E9
File No. E30112

EQUIPMENT COVERED BY OUR EXCLUSIVE
PART'S WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY

SEE PAGE 16

BLUE M

GENERAL SPECIFICATIONS AND PRICES

MAGNI-WHIRL: (Patented)—Automatic, self-timing electromagnet below bottom non-magnetic wall, periodically pulsates counterweighted rocker agitator plate. Variable, timed motion of agitator provides complete, gentle, quiet agitation and circulation throughout liquid mass, despite heavy bath loading. D.C. electromagnet energized and de-energized by a quality solid-state D.C. "packaged power supply" consisting of a Resistor-Capacitor network coupled into a unijunction transistor driving an SCR. External compensation for line voltage variations is provided.

SOLID-STATE PACKAGED POWER SUPPLY: No timing relays—reliable and trouble-free. Magnet coil and power supply unit fully protected by KLIXON® thermostat; mere touch on button plunger repositions bi-metal protector for instantaneous resumption of normal operation. Quality components mounted on printed circuit board.

AUTOMATIC DUAL MICROTROL: Hydraulic type, automatic temperature control with dual microswitches. Contacts totally enclosed and U.L. Listed. Stainless sensing bulb. Permits selection of any two temperatures most frequently used, but all temperatures within range may also be used without changing two routine settings.

JAR AND BASE: (Jar)—Heavy clear type—PYREX Brand Glass—with flat bottom and fire polished top—excellent transparency for full visibility. (Base and control compartment)—All polished 18-8 stainless. Hold down rods and threaded hexagon fittings which receive extension rods are also 18-8 stainless. Protective feet safeguard work surfaces.

PACKAGED CONTROL COMPARTMENT: Located at top of bath and removable instantly as a complete unit by disconnecting line cord and socket/plug assembly. PYREX jar is easily cleaned and replaced. Element terminal connections, one neon lamp, Automatic Dual Microtrol and main switch integrally panel mounted. Attractive panel removable for quick inspection. Compartment constructed of polished 18-8 stainless steel. Amber neon lamp denotes element is energized.

POWER SELECTOR SWITCH: Used on model MW-1172SSA-1 only. Selects proper wattage in relation to desired temperature. Increased efficiency.

HEATER ELEMENTS: Stainless, type 316, sheathed tubular design. Compacted magnesium oxide insulation and "cold end" terminals. Low watt density.

GLASS THERMOMETER: Etched stem, 1°C. graduations, 13 in. long, 2 in. immersion, mercury filled, white back. Scale range—10°C. to +110°C. Stainless steel bracket.

WIRING: All wiring is complete. Element terminals at top as illustrated. Baths ready for instant use. Removable cover permits inspection of wiring components. Baths tested for one minute at 1000 V., 60 Hz. U.L. Listed; meets N.E. Code, as amended. Six foot three wire rubber cord, plug and strain relief for all models except MW-1172SSA-1 which has terminal box.

Model Number	Size of PYREX Jar Inches (Cm.) Diameter	Height	*Temperature Range	Maximum Watts	**Voltage 50/60 Hz. A.C. Single Phase	Shipping Weight Lbs. (Kg.)	Complete Price
MW-1152SSA-1	8¼ (21)	8 (20)	5°C. Above Ambient to +100°C.	300	120 V.	40 (18)	$295.00
MW-1162SSA-1	12 (31)	12 (31)	5°C. Above Ambient to +100°C.	600	120 V.	45 (20)	415.00
MW-1172SSA-1	16 (40)	12 (31)	5°C. Above Ambient to +100°C.	1600	120 V.	70 (32)	550.00

*Maximum temperature of +100°C obtainable only when baths are covered
**Units available for 240 V and 208 V /1 Ph We will supply a separate autoformer package complete with line cord and plug. Simple installation

For Models Nos MW-1152SSA-1 and MW-1162SSA-1
Specify Part No E17E-1-1 ..... $90.00 Each

For Model No MW-1172SSA-1
Specify Part No E17E-1-2 ..... $120.00 Each

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories

Model Number	*Horizontal Extension Rods	**Vertical Extension Arms	Circular Solid Cover Part Number	Circular Solid Cover Price Each	Cooling Coil Part Number	Cooling Coil Price Each	Circular Wire Shelf Part Number	Circular Wire Shelf Price Each
MW-1152SSA-1	For All Models	For All Models	M21-E1	$43.00	M19-D1	$25.00	MO4-A301	$18.00
MW-1162SSA-1	Part No. M20-E1	Part No. M20-E2	M21-E3	50.00	M19-D2	27.00	MO4-A302	$26.00
MW-1172SSA-1	Price For Set of Two $16.00	Price for Set of Two $30.00	M21-E6	59.00	M19-D3	29.00	MO4-A304	32.00

EXTRA THERMOMETER: As described above.
Part No. CO1C-6 ..... $10.00 Each

***EXTENSION RODS:** Stainless, type 303, 18-8; ½" dia. x 8½" long. Assemble into hexagonal fittings at top of each hold down rod.

****EXTENSION ARMS:** Adjustable stainless, type 303, 18-8, ½" dia. x 8½" long. Fit extension rods above.

EXTRA JARS: PYREX, mold blown with ground open end. Modified with suitable aperature to receive magnetic pole piece.
For Model MW-1152SSA-1: Part No. M14-B1.. $29.00 Each
For Model MW-1162SSA-1: Part No. M14-B2.. $88.00 Each
For Model MW-1172SSA-1: Part No M14-B3. .$136.00 Each

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly

FOR FULL DESCRIPTION OF THESE AND OTHER ACCESSORIES, SEE PAGES 167-169.

BLUE M

Magni Whirl®

PATENTED IN U.S.A. AND CANADA

Constant Temperature

HYDROMETER JAR BATH

GREATER CAPACITY . . . TEN JARS

SOLID-STATE DESIGN AGITATION SYSTEM
Eliminates relays in agitation system!

WHISPER SILENCE
Pilot lamp added to denote bath is operating!

VARIABLE PULSE RATE
Agitation determined by you!

STAINLESS STEEL AGITATOR PLATE
Improves fluid directional flow, can't wear out!

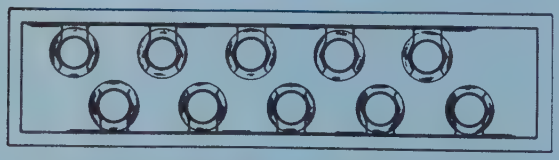
IMMUNE TO VOLTAGE CHANGES
Operates efficiently under wide voltage variations!

GREATER RESISTANCE TO AMBIENT TEMPERATURE CHANGES
Unimpaired efficiency despite them!

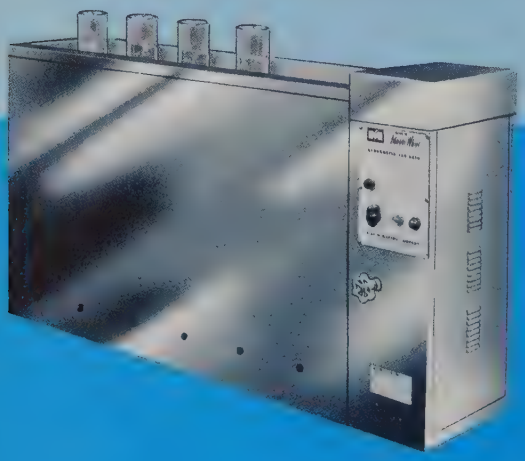
TEMPERATURE RANGE TO +50°C.
Minimum down to available water temperature.

GREATER SENSITIVITY ±0.4°C.

FINER WATER FLOW ADJUSTMENT



TOP VIEW Showing Jars (Not Supplied) In Position



PROVEN IN DESIGN OPERATION . . . PERFORMANCE HOLDS SUSPENSION AT +19.4°C. DURING HYDROMETER TESTS. ASTM DESIGNATION D-422 . . . AASHO METHOD T-88

GREATER UNIFORMITY AND LARGER CAPACITY AVAILABLE ONLY WITH MAGNI-WHIRL BATHS

Conventional Hydrometer Jar Baths employing stirrers or motors impose space limitations. Only eight jars can be accommodated and overcrowding is inevitable when circulating devices are introduced. Uniformity varies due to inadequate or haphazard agitation. Time and money are consumed . . . and you're still burdened with an inconvenient, inaccessible, unsatisfactory unit.

In Blue M MAGNI-WHIRL Hydrometer Jar Baths all areas are equally and gently agitated by means of its patented MAGNI-WHIRL built-in, automatic circulating system, assuring greater temperature uniformity throughout entire liquid mass. And two extra jars—ten in all—are easily accommodated and always accessible. Therefore, more hydrometer analysis tests to ASTM and AASHO specifications may be performed.

MODERN SOLID-STATE DESIGNED PACKAGED POWER SUPPLY . . . SILENT, TROUBLE-FREE! RE-ENGINEERED FOR GREATER RELIABILITY!

The patented MAGNI-WHIRL agitation system is now vastly improved to provide faster agitation, greater dependability, longer life, less maintenance. Timing and power relays are eliminated in agitation system . . . operation is silent . . . agitatior pulse rate is variable . . . fluid directional flow is improved . . . variations in line voltage and ambient temperature can be ignored.

THE MOST EFFICIENT AGITATION SYSTEM EVER DEVELOPED . . . Agitator plate is periodically pulsated by the automatic time energization of a D.C. electromagnet and D.C. solid-state "packaged power supply". Motion of the agitator, factory-set but variable to suit any operating requirement, provides complete, quiet agitation of the liquid.

EQUIPMENT COVERED BY OUR EXCLUSIVE
PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY
BLUE M
SEE PAGE 16

BLUE M

GENERAL SPECIFICATIONS AND PRICES

CONSTRUCTION: Marine plywood, covered externally with polished stainless steel, type 304, 18-8, provides both insulation and antibulge support for tank on sides, ends and bottom. Inner liner consists of heavy gauge, corrosion resistant stainless steel, spot welded and heli-arc welded to make it leakproof. Individual hydrometer jar support brackets, perforated bottom support, control compartment are corrosion resistant stainless steel, with all welds passivated. The jar clip holders are removable. All fittings, tubes, etc. are either brass or copper to insure long life.

MAGNI-WHIRL: (Patented)—Automatic, self-timing electromagnet below bottom non-magnetic wall, periodically pulsates agitator plate. Variable, timed motion of agitator provides complete, gentle, quiet agitation and circulation throughout entire liquid mass, despite heavy bath loading. D.C. electromagnet energized and de-emergized by a quality solid-state D.C. "packaged power supply" consisting of a Resistor-Capacitor network coupled into a unijunction transistor driving an SCR. External means of compensation for line voltage variations is provided for unusual operating conditions.

SOLID-STATE PACKAGED POWER SUPPLY: No timing relays—reliable and trouble-free. Magnet coil and power supply unit fully protected by KLIXON® thermostat; mere touch on button plunger repositions bi-metal protector for instantaneous resumption of normal operation. Quality components mounted on printed circuit board.

AUTOMATIC TRIGGER CONTROL: Automatic Hydraulic Thermostat, U.L. Listed and Canadian Standards Approved totally enclosed silver contacts. Plus, sensing bulb paralleled with water inlet tube for extreme sensitivity ±0.4°C. Automatic and adjustable from tap water temperature to +50°C.

BLUE M STAINLESS STEEL ELEMENTS (OVER-THE-TOP): Removable element assembly permits thorough efficient cleaning of tank. There are no welded fittings to receive elements. Inner tank is safe from leakage. Elements are of sheath design, of stainless steel, type 316, tubular, and with "cold end" terminals. Designed specifically for bath operation. They are of low watt density and are not affected by low temperatures.

WATER FEED CONTROL: Metered flow-control through packless alloy adjustable valve used in conjunction with high quality solenoid valve; provides extra fine volume control of water flow allowance as required. External copper connecting tube provided.

OVERFLOW DRAIN: ¾ in. N.P.T. stainless steel pipe located adjacent to top of tank; heli-arc welded to inner tank. Threaded to allow piping of overflow to sewer.

DRAIN: Each bath fitted with solid brass, brightly nickel-plated drain cock for convenient draining of bath. Rubber hose easily attached if desired.

NEON PILOT LAMP: White, denotes elements are energized.

MAIN SWITCH: Toggle type, on-off, ample capacity. U.L. Listed.

THERMOMETER: Etched stem glass, 0°C. to +70°C. scale range, ½°C. graduations, 12 in. long, 3 in. immersion, mercury filled, yellow back. Stainless steel thermometer holder provided.

WIRING: All wiring complete and enclosed at end of bath. Unit is ready for operation. Six foot rubber covered cord, 3 prong plug cap and strain relief provided.

Model Number	Full Working Space Inches (Cm.) L.	W.	D.	Overall Dimensions Inches (Cm.) L.	W.	D.	Approx. Capacity Gal. (L)	Total VA	Voltage 50/60 Hz. A.C. Single Phase	Shipping Weight Lbs. (Kg.)	Complete Price
HBJ-10A-1	38 (95)	8 (20)	15 (38)	49 (123)	14 (35)	24 (61)	21.6 (82)	1000	120 V.	130 (59)	$875.00

Unit available for 240V and 208 V /1 Ph We will supply a separate transformer package complete with line cord and plug Simple installation

Specify Part No E17E-1-1 . . . . . $90.00 Each

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories

EXTRA THERMOMETER: As described above.
Part No. CO1C-7 . . . . . $10.00 Each

BLUE M

MagniWhirl®

PATENTED IN U.S.A. AND CANADA

Constant HIGH Temperature

UTILITY OIL BATHS

with built-in overtemperature protection

SOLID-STATE DESIGN AGITATION SYSTEM
Eliminates relays in agitation system!

WHISPER SILENCE
Pilot lamp added to denote bath is operating!

VARIABLE PULSE RATE
Agitation determined by you!

STAINLESS STEEL AGITATOR PLATE
Improves fluid directional flow, can't wear out!

IMMUNE TO VOLTAGE CHANGES
Operates efficiently under wide voltage variations!

GREATER RESISTANCE TO AMBIENT TEMPERATURE CHANGES
Unimpaired efficiency despite them!

READY-READ 3½" DIA. TEMPERATURE INDICATOR

MEMORY RING® TEMPERATURE CALIBRATING DIAL AND DIAL POINTER LOCK

TWO TEMPERATURE RANGES
ONE SERIES: 5°C. above ambient to +180°C.
ONE SERIES: 5°C. above ambient to +260°C.

MEETS ASTM SPECIFICATIONS FOR METHODS D471, D865 and D1313*

FOR STABILITY TESTING, CONDITIONING, PREHEATING, TEMPERING . . . IN RESEARCH OR PRODUCTION

Maximum temperature obtainable with cover

Ready-Read Temperature Indicator installed as shown except on Models MW-1115A-1 and MW-1145A-1 which have indicator mounted on top cover.

PROVEN IN DESIGN . . . OPERATION . . . PERFORMANCE! AUTOMATICALLY MAINTAINS TEMPERATURE FROM 5°C. ABOVE AMBIENT TO +180°C. OR +260°C.—TEMPERATURE CONTROL TOLERANCE ±1°C.

MODERN SOLID-STATE DESIGNED PACKAGED POWER SUPPLY . . . SILENT, TROUBLE-FREE! RE-ENGINEERED FOR GREATER RELIABILITY!

The patented MAGNI-WHIRL agitation system is now vastly improved to provide faster agitation, greater dependability, longer life, less maintenance. Timing and power relays are eliminated in agitation system . . . operation is almost completely silent . . . agitator pulse rate is variable . . . fluid directional flow is improved . . . variations in line voltage and ambient temperature can be ignored. These plus many other exclusive Blue M features—including built-in overtemperature protection all in a completely redesigned all-stainless housing combining beauty and functional utility.

THE MOST EFFICIENT AGITATION SYSTEM EVER DEVELOPED . . . Built-in, automatic MAGNI-WHIRL circulating system saves the cost, time, and space required by conventional stirrers and agitation methods. Now redesigned to include solid-state components to eliminate failure-prone relays in the agitation system. Agitator plate is periodically pulsated by the automatic time energization of a D.C. electromagnet and D.C. solid-state "packaged power supply". Motion of the agitator, factory-set but variable to suit any operating requirement, provides complete, quiet agitation of the liquid.

QUALITY DESIGN AND CONSTRUCTION FEATURES THROUGHOUT . . . Besides these many major improvements, this series of MAGNI-WHIRL BATHS still offers all the quality features of the earlier models: removable stainless steel element assembly; convenient control panel; push-button reset switch to protect magnet and power supply; external means to compensate for line voltage variation of power supply.

MAXIMUM SAFETY . . . All bath components are especially designed for high temperature service. These baths eliminate the need for special hazard-safe motors and avoid frequent motor burn-outs. They come ready to use—with overtemperature protection—ready for life-long dependable service.

These baths are designed for use with Heat Transfer Fluids such as Polyalkylene Glycol (UCON) and Stable Oil Fluids. Also usable with water. *Care should be exercised to select Bath of proper size for apparatus required by the test to be performed.

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY

BLUE M

SEE PAGE 16

BLUE M

GENERAL SPECIFICATIONS AND PRICES

CONSTRUCTION: Double wall type—oil chamber and outer jacket constructed of heavy gauge polished 18-8 stainless steel, type 304. All edges and joints are heli-arc welded to form a tight, leakproof interior. Welds are passivated electrically. There are no welded fittings to receive elements.

INSULATION: Liquid chamber blanketed with 3 in. layers of Fiberglas wool. Heavy TRANSITE and Mono-Block insulated bottom area. Heat losses at high temperatures are minimized.

AUTOMATIC MICROTROL: Response sensitivity ±0.2°C., U.L. Listed, hydraulic expansion type. Stainless capillary and sensing bulb, type 316, for long life. All contacts totally enclosed; protected by powerful relay.

OVERTEMPERATURE PROTECTION: Safeguards valuable workloads and equipment.

BLUE M STAINLESS STEEL ELEMENTS (OVER-THE-TOP): Removable element assembly permits thorough cleaning of tank. No welded fittings to receive elements. Inner tank safe from leakage. Elements are of sheath design of stainless, type 316L, tubular, with "cold end" terminals. They are of low watt density, not affected by low temperature.

DRAIN: Stainless steel drain fitting and cap for convenient draining of bath when necessary.

MAGNI-WHIRL: (Patented)—Automatic, self-timing electromagnet below bottom non-magnetic wall, periodically pulsates agitator plate. Variable, timed motion of agitator provides complete, gentle, quiet agitation and circulation throughout entire liquid mass, despite heavy bath loading. D.C. electromagnet energized and de-energized by a quality solid-state D.C. "packaged power supply" consisting of a Resistor-Capacitor network coupled into a unijunction transistor driving an SCR. External means of compensation for line voltage variations is provided for unusual operating conditions.

SOLID-STATE PACKAGED POWER SUPPLY: No timing relays—reliable and trouble-free. Magnet coil and power supply unit fully protected by KLIXON® thermostat; mere touch of button plunger repositions bi-metal protector for instantaneous resumption of normal operation. Quality components mounted on printed circuit board.

NEON PILOT LAMPS (2): Amber denotes elements are energized; white shows pulse rate.

READY-READ TEMPERATURE INDICATOR: 3½" diameter —for easier, more efficient operation. Dual scale in degrees C. and F. Located in panel for all models except MW-1115A-1 and MW-1145A-1 which have indicator mounted in top cover.

WIRING: All wiring is complete and enclosed at end of bath. Ready for use. Removable cover permits inspection of wiring components. Baths tested for one minute at 1000 V., 60 Hz. Wiring meets N.E. Code, as amended. Terminal box.

TEMPERATURE RANGE: 5°C. above ambient to +180°C. (+356°F.)

Model Number	Full Working Space Inches (Cm.) L.	W.	D.	Overall Dimensions Inches (Cm.) L.	W.	D.	Approx. Capacity (Gallons)	Total VA	Voltage 50/60 Hz. A.C. Single Phase	Shipping Weight Lbs. (Kg.)	Complete Price With OTP
MW-1115A-1	12 (31)	7 (19)	7 (19)	27 (68)	14 (35)	16 (40)	3.5 (13)	1400	*120 V	65 (29)	$685.00
MW-1125C-1	18 (45)	18 (45)	15 (38)	32 (80)	25 (63)	24 (61)	22.9 (87)	3600	**240 V	190 (86)	1140.00
MW-1135C-1	36 (90)	18 (45)	9½ (24)	50 (127)	25 (63)	18 (45)	31.1 (117)	4000	**240 V	240 (109)	1425.00

UCON Heat Transfer Fluid HTF-101 is recommended for use with these baths. See details on Page 168

TEMPERATURE RANGE: 5°C. above ambient to +260°C. (+500°F.)

MW-1145A-1	12 (31)	7 (19)	7 (19)	27 (68)	14 (35)	16 (40)	3.5 (13)	1400	*120 V	65 (29)	$790.00
MW-1155C-1	18 (45)	18 (45)	15 (38)	32 (80)	25 (63)	24 (61)	22.9 (87)	4300	**240 V	190 (86)	1195.00
MW-1165C-1	36 (90)	18 (45)	9½ (24)	50 (127)	25 (63)	18 (45)	31.1 (117)	6000	**240 V	240 (109)	1445.00

*Units available for 240 V. and 208 V./1 Ph. We will supply a separate transformer package complete with line cord and plug. Simple installation. Specify Part No. E17E-1-2 ..... $120.00 Each

UCON Heat Transfer Fluid HTF-100 is recommended for use with these baths. See details on Page 168

**These models will operate reliably when connected to 208 volt service. A 25% reduction in element power will result

OPTIONAL AND RECOMMENDED ACCESSORIES — SPARE PARTS

Please give unit model no., and voltage when ordering accessories

Model Number	Removable Gable Cover with Handle Stainless Steel Part Number	Price Each	Polyalkylene Glycol (*UCON) Heat Transfer Fluid (See complete description on page 168) Catalog Number	Price Per 5 Gallons
MW-1115A-1	M21-A1	$34.00	HTF-101	$53.00
MW-1145A-1		34.00	HTF-100	53.00
MW-1125C-1	M21-A4	51.00	HTF-101	53.00
MW-1155C-1		51.00	HTF-100	53.00
MW-1135C-1	M21-A6	73.00	HTF-101	53.00
MW-1165C-1		73.00	HTF-100	53.00

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly.

*Registered Trademark U.C.C.

BLUE M

Magni Whirl®

PATENTED IN U.S.A. AND CANADA

Highest Quality Constant Temperature REFRIGERATED UTILITY BATHS *with*

POWER-O-MATIC 75®

PATENTS PENDING

high gain solid-state proportioning control system, built-in overtemperature protection, and recirculating pump, cover and constant water level feeder

DUAL TEMPERATURE DIALS
One Regulates to +50°C.
One Regulates above +50°C.

TEMPERATURE RANGE
+10°C. to +100°C. (+212°F.)
(Using Water)
0°C. to +100°C.
(Using Stable Fluids)

TEMPERATURE STABILITY: ±0.1°C.

TYPICAL UNIFORMITY
±0.2°C. at +10°C. and +50°C.
±0.2°C. at +80°C.

SETABILITY: ±0.1°C. or less

REPEATABILITY: ±0.1°C. or less

NEW DUAL CONTROL SYSTEM GREATLY IMPROVES PERFORMANCE OF OUR FINEST REFRIGERATED BATHS

The use of Blue M's newest and best solid-state proportioning control system on what was already our finest refrigerated baths provides the scientific and laboratory field with a series of units with exceptional performance characteristics. These baths are ideal for calibrating processes since there is no cycling of controls. They are also recommended for working to many MIL and JAN Specifications, and for all constant temperature work involving viscosity, ASTM Tests, instrument calibration, biochemical tests, and critical procedures requiring above or below ambient temperatures.

The POWER-O-MATIC 75 Control offers all the advantages of the system described on pages 12 and 13, and provides even better performance. Two separate setting dials, one regulating the bottom half of the temperature range and one the top half, assures setability of ±0.2°C. or better. Stability and uniformity approximates this accuracy. Quality Refrigerant 12 mechanical refrigeration system, described in detail on the next page, is built to easily withstand the most demanding service. Built-in overtemperature protection safeguards workloads and equipment.

These baths also feature the quietest, most efficient agitation system ever developed. There are no motors or stirrers. Built-in, automatic MAGNI-WHIRL circulating system saves the cost, time and space required by conventional stirrers and agitation methods. Counterweighted rocker agitator plate is periodically pulsated by the automatic time energization of a D.C. electromagnet and D.C. solid-state "packaged power supply". Rocking motion of the agitator, factory-set but variable to suit any operating requirement, provides complete, quiet agitation of the liquid. Units also offer all the quality design and construction features of other MAGNI-WHIRL Baths.

If critical performance over an extremely broad temperature range is important to your operations, these fine baths will unquestionably meet your every requirement.

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY BY BLUE M

SEE PAGE 10

BLUE M

GENERAL SPECIFICATIONS AND PRICES

POWER-O-MATIC 75 CONTROL SYSTEM: Unique high gain solid-state proportioning control, designed and built by Blue M specifically for these quality baths, and assures their outstanding performance characteristics. Features two separate setting dials: one regulates bottom half of bath temperature range, the other the top half. Each dial requires 10 full turns to cover its 50°C. span, providing unequalled setability. Each dial offers patented Memory Ring® Temperature Calibrating feature and dial pointer lock. Temperature Range Switch activates high or low dial and two neon pilot lamps indicate which dial is in control.

OVERTEMPERATURE PROTECTION: Exclusive Blue M independent, direct line system provides positive safety for both workload and bath.

CONSTRUCTION: Bath double wall type of polished 18-8 stainless steel, type 304. Inner tank heli-arc welded and passivated to form tight, leakproof interior.

BASE: Heavy gauge cold rolled steel finished in attractive blue-gray baked-on chemical resistant epoxy enamel. Four ball bearing casters allow mobility. Recessed control panel not subjected to accidental bumping or spillage when transferring objects to and from bath.

COVER: Insulated, flat, all stainless steel.

INSULATION: Water chamber blanketed with compressed Fiberglas; moisture-proof and will not settle.

BLUE M STAINLESS STEEL ELEMENTS (OVER-THE-TOP): Removable element assembly permits thorough cleaning of tank. No welded fittings to receive elements. Inner tank safe from leakage. Elements are of sheath design, of stainless type 316, tubular, with "cold end" terminals. They are of low watt density, not affected by low temperatures.

MAGNI-WHIRL: (Patented)—Automatic, self-timing electromagnet below bottom non-magnetic wall, periodically pulsates counterweighted rocker agitator plate. Variable, timed rocking motion of agitator provides complete, gentle, quiet agitation and circulation throughout entire liquid mass, despite heavy bath loading. D.C. electromagnet energized and de-energized by a quality solid-state D.C. "packaged power supply" consisting of a Resistor-Capacitor network coupled into a unijunction transistor driving an SCR. External means of compensation for line voltage variations is provided for unusual operating conditions.

SOLID-STATE PACKAGED POWER SUPPLY: No timing relays—reliable and trouble-free. Magnet coil and power supply unit fully protected by KLIXON® thermostat; mere touch on button plunger repositions bi-metal protector for instantaneous resumption of normal operation. Quality components mounted on printed circuit board.

MECHANICAL REFRIGERATION SYSTEM: Completely self-contained with quality oversize Refrigerant 12 air-cooled compressor and expansion valve system. Compressor runs continuously when operating below ambient. Suction line desuperheater cools refrigerant before it is returned to compressor; extends compressor life under all operating conditions. Pumpdown cycle automatically pumps refrigerant into receiver and holds off compressor during high temperature operation. Built-in, partially removable copper cooling coil has extra heavy nickel plating. Entire system designed for maximum severity service and for efficient operation even during summer. Each unit tested electronically to insure gas tight system.

CIRCULATION PUMP: Quality, long-lived, allows circulation of bath media through spectrophotometers, chromatography columns and other equipment where constant temperature is desired. NOTE: Pump not designed for use with temperatures exceeding +70°C. (+158°F.)

CONSTANT WATER LEVEL FEEDER (Strainer Type): Connects to water supply, maintains constant water level in bath at all temperatures irrespective of test time length. Strainer prevents passage of foreign materials.

GLASS THERMOMETER: Mercury in glass type, manufactured in accordance with National Bureau of Standards specifications. Extremely precise grade. Calibrated -2°C. to +105°C., 0.1°C. divisions, 24 in. long. Stainless steel support bracket supplied.

VOLTMETER: Indicates voltage impressed on elements.

CIRCUIT BREAKER: As overload protection.

WIRING: Complete, enclosed and meets N.E. Code, as amended. Terminal box provided.

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	*Voltage 60 Hz. A.C. Single Phase	Total VA	Refrig. H.P.	Shipping Weight Lbs. (Kg.)	Complete Price With OTP
POM-2416A-2	24 (64)	12½ (32)	10 (25)	34 (86)	22 (55)	44 (110)	120 V.	3360	1/3	400 (181)	$2465.00

*Unit available for 240V. and 208 V /1 ph. We will supply a separate autoformer package complete with line cord and plug. Simple installation

Specify Part No E17E-1-3. ..... $210.00 Each

NOTE For 50 Hz operation, contact factory

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no , and voltage when ordering accessories

EXTRA THERMOMETER: As described above.
Specify Part No. CO1C-2 ..... $27.00 Each

BLUE M

Magni Whirl®

PATENTED IN U.S.A. AND CANADA

Bench Type Constant Temperature

REFRIGERATED BATHS

SOLID-STATE DESIGN
Eliminates relays in both the control and agitation system!

WHISPER SILENCE
Pilot lamp added to denote bath is operating!

VARIABLE PULSE RATE
Agitation determined by you!

ROCKER AGITATOR PLATE
Improves fluid directional flow, can't wear out!

IMMUNE TO VOLTAGE CHANGES
Operates efficiently under wide voltage variations!

STAINLESS SENSING BULB

GREATER RESISTANCE TO AMBIENT TEMPERATURE CHANGES
Unimpaired efficiency despite them!

VERSATILE DUAL MICROTROL
Automatically repeats any two consistently used temperatures

MEMORY RING® TEMPERATURE CALIBRATING DIAL

- **NO ICE!**
- **NO CIRCULATION OF COLD WATER!**
- **NO AUXILIARY EQUIPMENT NECESSARY!**

Model MR-3210A-1 and MR-3220A-1 as illustrated. MR-3240C-1 has separate refrigeration compartment.

MAXIMUM TEMPERATURE OBTAINABLE WITH COVER

PROVEN IN DESIGN, OPERATION, PERFORMANCE!
AUTOMATICALLY MAINTAINS TEMPERATURES FROM 0°C. TO +100°C.
CONSTANCY: ±0.2°C. OR BETTER.

**MODERN SOLID-STATE DESIGN.
NO RELAYS, SILENT, TROUBLE-FREE!
RE-ENGINEERED FOR GREATER RELIABILITY!**

The patented MAGNI-WHIRL agitation system is now vastly improved to provide faster agitation, greater dependability, longer-life, less maintenance.

THE MOST EFFICIENT AGITATION SYSTEM EVER DEVELOPED . . . Built-in, automatic MAGNI-WHIRL circulating system saves the cost, time and space required by conventional stirrers and agitation methods. Now redesigned to include solid-state components to eliminate failure-prone relays in control circuit and agitation system. New counter weighted rocker agitator plate is periodically pulsated by the automatic time energization of a D.C. electromagnet and D.C. solid-state "packaged power supply". Rocking motion of the agitator, factory-set but variable to suit any operating requirement, provides complete, quiet agitation of the liquid. Temperature is uniform throughout the entire water mass to ±0.2°C. or better.

BATH PROPER AND COMPRESSOR U.L. LISTED!

A quality, self-contained, refrigerated bath for all tests. Best efficiency at ambient or slightly below . . . yet, capacity of 0°C. to extreme +100°C., built in.

SIMPLE OPERATION! Turn on main switch and compressor switch and set Automatic Dual Microtrol. Compressor runs continuously (longer life than stopping and starting). Temperature maintained by cycling of heaters since HEAT INPUT IS GREATER THAN COOLING CAPACITY OF COMPRESSOR. When temperatures above ambient are required, turn compressor switch off and operate bath in conventional manner. From +10°C. to 0°C. temperatures, use nonfreezing liquid medium such as ethylene glycol or alcohol.

THESE REFRIGERATED BATHS are recommended for constant temperatures involving Viscosity, ASTM Tests, Instrument Calibrations, Biochemical Tests, and all procedures requiring below ambient temperatures particularly.

EQUIPMENT COVERED BY OUR EXCLUSIVE
PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY

SEE PAGE 10

BLUE M

GENERAL SPECIFICATIONS AND PRICES

CONSTRUCTION: Double wall: inner chamber, outer jacket, base and compressor of polished stainless, type 304. Heli-arc welded to form leakproof interior. No welded fittings to receive elements. Welds passivated. Protective feet safeguard work surfaces.

INSULATION: Inner chamber blanketed with 1 in. Fiberglas; moisture-proof, will not settle. Thermal conductivity is 0.23.

AUTOMATIC DUAL MICROTROL: Hydraulic type, automatic temperature control with dual microswitches. Contacts are totally enclosed, U.L. Listed. Stainless sensing bulb. Permits selection of any two temperatures used; but all tempertures (±0.2°C. control) may be used without changing two routine settings.

SOLID-STATE EVER-CYCLE SWITCHING CIRCUIT: SCR controls high wattage elements by very low current through microswitches. Eliminates relays and moving parts . . . extends microswitch life . . . greatly improves reliability. Quiet, safe, sure!

SOLID-STATE PACKAGED POWER SUPPLY: No timing relays—reliable and trouble-free. Magnet coil and power supply protected by KLIXON® thermostat; touch on button plunger repositions bi-metal protector for resumption of normal operation. Quality components on printed circuit board.

BLUE M STAINLESS STEEL ELEMENTS (OVER-THE-TOP): Removable for thorough cleaning of tank. Sheath design, of stainless, type 316 tubular, with "cold end" terminals. Low watt density, not affected by low temperatures.

DRAIN: Solid brass, brightly nickel-plated drain cock.

NEON PILOT LAMPS (3): Amber, denotes elements are energized; white shows pulse rate—denotes bath is operating; blue shows compressor is in use.

MAGNI-WHIRL: (Patented)—Automatic, self-timing electromagnet below bottom non-magnetic wall, periodically pulsates counterweighted rocker agitator plate. Variable, timed rocking of agitator provides complete, gentle, quiet agitation and circulation throughout liquid, despite heavy loading. D.C. electromagnet energized and de-energized by solid-state D.C. "packaged power supply" consisting of a Resistor-Capacitor network coupled into a unijunction transistor driving an SCR. External compensation for line voltage variations.

MECHANICAL CONSTANT-FLOW REFRIGERATION SYSTEM: Quality hermetically sealed compressor, using Refrigerant 12. Large fan cooled condenser, refrigerant dryer and expansion valve metering system. Bright nickel-plated copper cooling coil. Smooth, quiet operation. Long, trouble free service. All components in polished stainless cabinet. However, Model No. MR-3240C-1 has separate refrigeration compartment. Each unit tested electronically to insure gas tight system. Bath proper and compressor U.L. Listed.

GLASS THERMOMETER: Etched stem, 1°C. graduations, 12 in. long, 2 in. immersion, mercury filled, white back. Range —10°C. to +110°C. Stainless bracket.

WIRING: Complete and enclosed at end of bath. Ready for use. Removable cover permits inspection of components. Bath tested one minute at 1000 V., 60Hz. Wiring meets N.E. Code, as amended. Six foot rubber cord, three wire plug and strain relief for Model MR-3210A-1. Terminal box with others.

Model Number	Full Working Space Inches (Cm.) L.	W.	D.	Outside Dimensions Inches (Cm.) L.	W.	D.	Approx. Capacity Gal. (L)	Required Time To Reduce +32°C. Media to 0°C.	Total VA	Refrig. H.P.	Voltage 60 Hz. A.C. Single Ph.	Shipping Weight Lbs. (Kg.)	Complete Price
MR-3210A-1	12 (31)	7½ (19)	*7 (18)	19 (48)	23 (58)	17 (43)	2.72 (9)	120 minutes	1300	1/5	†120 V.	120 (54)	$935.00
MR-3220A-1	18 (45)	12 (31)	*7 (18)	27 (68)	28 (70)	17 (43)	8.50 (32)	240 minutes	2100	1/5	†120 V.	140 (63)	1085.00
MR-3240C-1	34½ (87)	18 (45)	*9 (23)	45 (113)	32 (80)	19 (48)	31.1 (117)	250 minutes	3750	1/3	240 V.	360 (163)	1875.00

*Diffuser plate is reversible. Reduces depth to 5 in. if required
†Units available for 240 V. or 208 V./1 Ph. We will supply a separate autoformer package complete with line cord and plug. Simple installation.
For Model Nos. MR-3210A-1 and MR-3220A-1 Specify Part No. E17E-1-2 $120.00 Each
For Model No. MR-3240C-1 (208 V. operation) Specify Part No. E17E-1-4 $140.00 Each

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories

Model Number	Removable Solid Gable Cover with Handle Part Number	Price Each	Concentric Ring Cover with Concentric Ring Sets Part Number	Number of Sets Per Cover	Complete Price	Test Tube Rack Part No. M20-D3 20 Tube Capacity Number Per Bath	Price Each	*Constant Water Level Feeder	Extra Thermometers
MR-3210A-1	M21-A16	$35.00	M21-C12	2	$50.00	3	$13.00	For All Models	For All Models
MR-3220A-1	M21-A17	42.00	M21-C13	6	120.00	8	13.00	Cat. No. JA-O-O1	Part No. CO1C-6
MR-3240C-1	M21-A18	76.00	M21-C11	8	210.00	21	13.00	Installed $78.00	$10.00 Each

***RECIRCULATING PUMP:** Permits liquid medium to be circulated through cooling condenser, refractometers, jacketed units, spectrophotometers, etc. Stainless steel shaft and neoprene seals.

Cat. No. JF-A-03 (120 V./60 Hz A.C.) $160.00 Installed
Cat. No. JF-C-01 (240 V./60 Hz. A.C.) $160.00 Installed

IMPORTANT NOTE: All pumps have a maximum allowable liquid temperature of +160°F. (+71°C.). For circulating higher temperatures, contact factory.

*Constant Water Level Feeder and Recirculating Pump cannot be installed together on the same bath.

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly.

FOR FULL DESCRIPTION OF THESE AND OTHER ACCESSORIES, SEE PAGES 167-169

BLUE M

Magni Whirl®

PATENTED IN U.S.A. AND CANADA

Bench Type Constant Temperature FULL VISIBILITY

refrigerated JAR (PYREX brand glass) BATHS

SOLID-STATE DESIGN AGITATION SYSTEM
Eliminates relays in agitation system!
WHISPER SILENCE
Pilot lamp added to denote bath is operating!
VARIABLE PULSE RATE
Agitation determined by you!
IMMUNE TO VOLTAGE CHANGES
Operates efficiently under wide voltage varations!
GREATER RESISTANCE TO AMBIENT TEMPERATURE CHANGES
Unimpaired efficiency despite them!
STAINLESS SENSING BULB
VERSATILE DUAL MICROTROL
Automatically repeats any two consistently used temperatures.
MEMORY RING® TEMPERATURE CALIBRATING DIAL

- **NO ICE!**
- **NO CIRCULATION OF COLD WATER!**
- **NO AUXILIARY EQUIPMENT NECESSARY!**

MAXIMUM TEMPERATURE OBTAINABLE WITH COVER

PROVEN IN DESIGN, OPERATION, PERFORMANCE!
AUTOMATICALLY MAINTAINS TEMPERATURES FROM 0°C. TO +100°C.
CONSTANCY: ±0.1°C.

MODERN SOLID-STATE DESIGNED PACKAGED POWER SUPPLY . . . SILENT, TROUBLE-FREE! RE-ENGINEERED FOR GREATER RELIABILITY!

The patented MAGNI-WHIRL agitation system is now vastly improved to provide faster agitation, greater dependability, longer-life, less maintenance.

THE MOST EFFICIENT AGITATION SYSTEM EVER DEVELOPED . . . Built-in, automatic MAGNI-WHIRL circulating system saves the cost, time and space required by conventional stirrers and agitation methods. Now redesigned to include solid-state components to eliminate failure-prone relays in the agitation system. Counterweighted rocker agitator plate is periodically pulsated by the automatic time energization of a D.C. electro-magnet and D.C. solid-state "packaged power supply" located in the polished stainless steel base compartment. Rocking action of the agitator, factory-set but variable to suit any operating requirement, provides complete, quiet agitation of the liquid. Jar is easily cleaned since control compartment and element assembly are removable instantly as a complete unit.

BASIC COMPONENTS U.L. LISTED! A quality, self-contained refrigerated bath for all tests. Best efficiency at ambient or slightly below . . . yet, capacity of 0°C. (with suitable media) to +100°C., built-in.

SIMPLE OPERATION! Turn on compressor switch and set Automatic Dual Microtrol. Compressor runs continuously (longer life than stopping and starting). Temperature maintained by cycling of heaters since HEAT INPUT IS GREATER THAN COOLING CAPACITY OF COMPRESSOR. When temperatures above ambient are required, turn compressor switch off and operate bath in conventional manner. From +10°C. to 0°C. temperatures, use non-freezing liquid medium such as ethylene glycol or alcohol.

THESE REFRIGERATED BATHS are recommended for constant temperatures involving Viscosity, ASTM Tests, Instrument Calibrations, Biochemical Tests, Stability Tests, Aging and all procedures requiring below ambient temperatures particularly.

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY BLUE M

SEE PAGE 16

BLUE M

GENERAL SPECIFICATIONS AND PRICES

MAGNI-WHIRL: (Patented)—Automatic, self-timing electromagnet below bottom non-magnetic wall, periodically pulsates counterweighted rocker agitator plate. Variable, timed motion of agitator provides complete, gentle, quiet agitation and circulation throughout liquid mass, despite heavy loading. D.C. electromagnet energized and de-energized by a quality solid-state D.C. "packaged power supply" consisting of a Resistor-Capacitor network coupled into a unijunction transistor driving an SCR. External compensation for line voltage variations is provided.

SOLID-STATE PACKAGED POWER SUPPLY: No timing relays—reliable and trouble-free. Magnet coil and power supply unit fully protected by KLIXON® thermostat; mere touch on button plunger repositions bi-metal protector for instantaneous resumption of normal operation. Quality components mounted on printed circuit board.

AUTOMATIC DUAL MICROTROL: Hydraulic type, automatic temperature control with dual microswitches. Contacts totally enclosed, U.L. Listed. Stainless sensing bulb. Permits selection of any two temperatures most used. For example: can be set for two routine procedures requiring +37°C. and +56°C. respectively, but all temperatures in the range from 0°C. to +100°C.* may be used without changing the two routine settings.

MECHANICAL CONSTANT-FLOW REFRIGERATION SYSTEM: Quality hermetically sealed compressor, using Refrigerant 12. Large fan cooled condenser, expansion valve metering system. Bright nickel-plated copper cooling coil. Smooth, quiet operation. Long, trouble free service assured. All components compactly housed in separate polished stainless cabinet. Covered connector tubes join bath cooling coil to compressor. Each unit tested electronically to insure gas tight system. Basic components are U.L. Listed.

HEATING ELEMENTS: Stainless, type 316, sheathed tubular design. Have compacted magnesium oxide insulation and "cold end" terminals. Low watt density.

JAR AND BASE: (Jar)—Heavy clear type—PYREX Brand Glass—with flat bottom and fire polished top—excellent transparency for full visibility. (Base and Control Compartment)—polished 18-8 stainless. Hold down rods threaded hexagon fittings which receive extension rods, and compressor cabinet also stainless. Protective feet safeguard work surfaces.

PACKAGED CONTROL COMPARTMENT: At top of bath, removable instantly as a complete unit by disconnecting line cord and socket/plug assembly. PYREX jar is easily cleaned and replaced. Element terminal connections, one neon lamp, Automatic Dual Microtrol and main switch integrally panel mounted. Attractive panel removable for quick inspection. Compartment constructed of polished 18-8 stainless. Amber lamp denotes element operation.

POWER SELECTOR SWITCH: Selects proper wattage in relation to desired temperature. Increased efficiency.

GLASS THERMOMETER: Etched stem, 0.1°C. graduations, 13 in. long, 2 in. immersion, white background, mercury filled, scale range—10°C. to +110°C. Stainless bracket.

WIRING: All wiring complete and enclosed. Ready for instant use. Baths tested for one minute at 1000 V., 60 Hz. Wiring meets amended N.E. Code. Six ft. three wire rubber cord, plug and strain relief provided for MR-3262A-1—other model has terminal box.

Model Number	Size of PYREX Jar Inches (Cm.)		Approximate Capacity Gal. (L)	Total VA	Refrig. H.P.	**Voltage 60 Hz. A.C. Single Phase	Shipping Weight Lbs. (Kg.)	Complete Price
	Diameter	Height						
MR-3262A-1	12 (31)	12 (31)	4.5 (17)	1700	1/5	120 V.	175 (79)	$1085.00
†MR-3272A-1	16 (40)	12 (31)	9.0 (34)	2600	1/3	120 V.	300 (136)	1360.00

*Maximum temperature of +100°C obtainable only if bath is covered. Requires 180 minutes to reduce +32°C. media to 0°C. (4.5 gals.)
**Either unit available for 240 V. and 208 V./1 Ph. We will supply a separate autoformer package complete with line cord and plug. Simple installation

For Model No MR-3262A-1 Specify Part No E17E-1-2 $120.00 Each
For Model No MR-3272A-1 Specify Part No E17E-1-3 $210.00 Each

†This model only has separate refrigeration compartment with 6 ft. long flexible hoses to allow placement below bench, conserving table top space

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories

Model Number	*Horizontal Extension Rods	**Vertical Extension Arms	Circular Solid Cover		Circular Wire Shelf		Extra Thermometers (As Described Above)
			Part Number	Price Each	Part Number	Price Each	
MR-3262A-1	Part No. M20-E1	Part No. M20-E2	M21-E5	$52.00	MO4-A302	$26.00	Part No. CO1C-6 $10.00 Each
MR-3272A-1	Set of Two $16.00	Set of Two $30.00	M21-E8	61.00	MO4-A304	32.00	

***EXTENSION RODS:** Stainless, type 303, 18-8; ½" dia. x 8½" long. Assemble into hexagonal fittings at top of each hold down rod.

****EXTENSION ARMS:** Adjustable stainless, type 303, 18-8, ½" dia. x 8½" long. Fit extension rods above.

EXTRA JARS: PYREX, mold blown with ground open end. Modified with suitable aperature to receive magnetic pole piece.
For Model MR-3262A-1: Part No. M14-B2 ..... $88.00 Each
For Model MR-3272A-1: Part No. M14-B3 .... $136.00 Each

Shipping weights shown are for standard models Units ordered with accessories may require special packing, increasing shipping weight slightly

FOR FULL DESCRIPTION OF THESE AND OTHER ACCESSORIES, SEE PAGES 167-169.

BLUE M

Flow-Tru™

REFRIGERATED BATH CIRCULATOR

with

POWER-O-MATIC 70® PATENTED

solid-state proportioning control system

ALL STAINLESS STEEL
Housing, tank, pump, heater, cooling coil and internal parts.

CAPACITY
1.25 gallons

TEMPERATURE RANGE
+70°C. to -10°C. (+158°F. to +14°F.)

TYPICAL RUN-UP TIME
+5°C. to +70°C.: Approx. 25 min.

TYPICAL PULL-DOWN TIME
+70°C. to +5°C.: Approx. 90 min.

TYPICAL LIQUID TEMPERATURE UNIFORMITY
±0.1°C. or less
NOTE: Not to be confused with control sensitivity.

MEMORY RING® TEMPERATURE CALIBRATING DIAL

Unit shown with cover set to one side

A VERSATILE +70°C. TO -10°C. UNIT— A SOURCE OF TEMPERED LIQUID AND A CONVENIENT PROCESSING BATH REQUIRING JUST ONE SQUARE FOOT OF TABLE SPACE

Blue M's new Refrigerated Bath Circulator meets the long-standing demand for a first-quality unit to serve two functions: as a source of tempered liquids for auxiliary heating/cooling, and as a bath for direct processing at any temperature within its range.

Offering a versatile +70°C. to -10°C. range, the unit consists of a compact, polished stainless steel compartment housing a 1/6 H.P. single stage air-cooled Refrigerant 12 compressor. A custom-built stainless steel dual pump circulates liquid uniformly in the integral bath as well as externally. Internal and external circulation can be conducted simultaneously or independently. Both compressor and pump motor are plug-in design for easy service if required.

A unique function selector dial enables the operator to easily select and activate the function he desires. He simply dials the desired operation—Cool, Heat or Pump. The unit automatically performs it.

This dial works in conjunction with the POWER-O-MATIC 70 Control. The desired temperature is simply set and the appropriate Cool or Heat function is activated. POWER-O-MATIC 70 automatically achieves and maintains the required temperature. The circulation pump is then activated as desired.

Please note that POWER-O-MATIC 70 is a true proportioning control, fully automatic in operation. It should not be confused with the conventional on-off controls which inherently produce significant overshooting and undershooting often used on units of this kind.

Also, the temperature uniformity shown of ±0.1°C. for this Blue M Circulator is the actual uniformity of the liquid, ready for use, after it has been cooled or heated. This has nothing to do with the meaningless sensitivity of the control often quoted as a measure of performance. It is the temperature of the liquid when you are ready to use it that counts. This becomes obvious when you remember that the tempered liquid when used for auxiliary processing may be circulated through equipment under excessive heat loads. This can cause as much as a 10°C. difference in liquid temperature from the time it leaves the stabilized source until it returns. Under such typical conditions, the demand for greater uniformity than that provided by this Blue M unit becomes patently ridiculous.

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY BLUE M

SEE PAGE 18

BLUE M

The application of Blue M's patented POWER-O-MATIC 70 Solid-State Proportioning Control to this new Refrigerated Bath Circulator can be considered to be a milestone in the development of equipment of this kind. Proven in thousands of installations, this super-fine control system has demonstrated its efficiency and reliability in countless operating situations.

As described in detail on pages 12 and 13, POWER-O-MATIC 70 offers many advantages which make its use here only logical. Its ability to assure true straight-line performance, of course, is of prime importance. Coupled with built-in ambient and line voltage compensation, it offers a degree of performance which rivals even the most sophisticated instrumentation.

But of particular significance is the fact that POWER-O-MATIC 70 is an exclusive control—designed, engineered and built by Blue M. This new Refrigerated Bath Circulator was—literally—designed and built around this system. It was engineered to match the control perfectly . . . to complement it to an extent impossible to duplicate when parts and components from many different manufacturers are combined into a single unit. Thus, Blue M has broken with tradition. The result is a unique unit which offers uniquely reliable performance throughout its operating range . . . performance which is more than adequate to meet the great majority of applications.

GENERAL SPECIFICATIONS AND PRICES

HOUSING: All-polished 18-8 stainless steel, heli-arc welded. Has adequate cross ventilating areas to assure proper air circulation. Removable panels provide ready access to all operating components. Unit rests on No-Mar plastic feet.

MECHANICAL REFRIGERATION: Blue M engineered quality single stage system, air-cooled using Refrigerant 12. 1/6 H.P. is ample to assure the unit's operating range.

CIRCULATING PUMP AND MOTOR: Stainless steel, custom-built for this unit. Rated at 1/20 H.P. with a 4 GPM capacity, 4 ft. head. Dual purpose: circulates liquid in integral bath and/or circulates liquid externally for auxiliary heating and cooling. Plug-in design for easy service.

EXTERNAL FLOW CONTROL VALVE: Simple means for regulating external liquid flow. Positive screw adjustment.

FUNCTION SELECTOR DIAL: Operates in conjunction with POWER-O-MATIC 70 Control. Attractive control panel clearly differentiates each operation: Cool—for operation at temperatures below ambient; Heat—for operation above ambient; Pump—to activate pump for circulation of liquid. Individual neon pilot lamps—distinctively colored blue, red and amber—immediately show which function has been activated.

BATH CONSTRUCTION: Polished stainless steel, heli-arc welded and passivated to assure tight, leakproof interior. Adequately insulated to help maintain liquid temperature uniformity.

IMMERSION HEATER: Stainless steel, sheathed type. Scientifically designed to provide optimum heating efficiency. Rated at 850 watts.

COVER: Removable. Constructed of special self-insulating material. Flanged design for snug fit. Aluminum handle.

DRAIN: Provides complete convenient bath drainage. External shut off valve.

GLASS THERMOMETER: Etched stem, 0.2°C. graduations, 14 in. long, mercury filled. Scale range -15°C. to +75°C.

WIRING: Complete and enclosed, meets N.E. Code as amended. Six foot, three wire line cord and plug.

Model Number	Actual Bath Working Space Inches (Cm.)			Overall Dimensions Including Motor Inches (Cm.)			Capacity BTU/HR at 0°C.	Reservoir Capacity Gal. (L)	Total VA	Voltage 60 Hz. A.C. Single Phase	Shipping Weight Lbs. (Kg.)	Complete Price
	L.	W.	†D	W.	D.	H.						
RBC-10A-1	7 (18)	3 (8)	5½ (13)	16 (40)	13¼ (33)	24 (60)	450	1.25 (4.7)	1360	120 V.	100 (45)	[illegible]

†Immersion depth

BLUE M

Tissue-Brite®

Tissue Flotation Bath and Slide Dryer

BUILT-IN LIGHT SOURCE
Brilliantly illuminates even the thinnest tissue . . . minimizes eye fatigue, improves efficiency, sharply reduces process time. Practically no glare.

REMOVABLE GLASS FLOTATION DISH
Facilitates filling, cleaning and sterilization.

STAINLESS STEEL HOUSING
Typifies quality of entire unit. Assures long life, maximum corrosion resistance, ease of cleaning.

AUTOMATIC TRIGGER CONTROL ON BATH
±0.5°C. response. Reference dial eliminates conventional screwdriver temperature settings, assures repeat control throughout unit's range of ambient to +60°C. (+140°F.)

SLIDES DRIED IN ANY POSITION
Three standard size glass staining racks each hold (10) 1" X 3" glass microscope slides (20 back to back). Racks can be used vertically or horizontally.

MODEL TB-610SDA
Tissue-Brite Flotation Bath and Slide Dryer combined

MODEL TB-610A
Tissue-Brite Flotation Bath when ordered separately

PROVEN! MAJOR ADVANTAGES PUT THIS BATH YEARS AHEAD OF COMPETITION

MAXIMUM OPERATION EFFICIENCY

—WITH ECONOMY TO MEET ANY BUDGET!

This bath ends the severe eye fatigue and accompanying decrease in operator efficiency common with typical competitive units. A built-in fluorescent lamp with a polished aluminum reflector casts a strong light away from the operator, over and below the surface of the liquid. This brilliantly illuminates even the smallest, thinnest tissue sections, causing them to stand out clearly. By sharply reducing eye strain, this enables the operator to perform his other duties with undimished efficiency while greatly speeding up the tissue flotation process.

The unit's convenient slide dryer compartment quickly and efficiently dries slides to expedite the dyeing process. It also frees incubators often used for this service for more productive work. Slides can be dried vertically or horizontally in three staining racks. Retaining clips hold slides gently. Drying is accomplished by tempered air mechanically propelled through the compartment. A switch permits selection of either of two pre-set temperatures—one about 5°C. above ambient and one about 40°C. above. The higher temperature will rapidly drive off moisture, melt off excess paraffin, and help set adhesives. The lower temperature will dry the slides without melting the paraffin or will cool the paraffin below its melting point if the slides are dried rapidly. The compartment has a full door which swings open vertically and remains open automatically, enabling slide containers to be inserted and removed easily. A removable stainless drip pan covers the entire bottom of the drier compartment.

The many advanced design and engineering features of this bath, coupled with traditional Blue M quality and modern appearance, add up to an attractive bath with superior operating characteristics—a valuable addition to any laboratory performing pathological or histological tests.

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY BLUE M

SEE PAGE 10

BLUE M

GENERAL SPECIFICATIONS AND PRICES

CONSTRUCTION: Bath housing and dryer compartment polished 18-8 stainless. All welds passivated. Dryer compartment has vertical full-swing stainless door with bakelite handle. Stainless drip pan. Unit rests on No-Mar rubber feet.

FLOTATION DISH: Heat resistant borosilicate glass. Instantly removable for filling and cleaning.

AUTOMATIC TRIGGER CONTROL: Hydraulic thermoregulator with ±0.5°C. response. Control performance superior to bimetal thermostat usually furnished with equipment of this kind. Numbered thermostat setting dial eliminates screwdriver setting, assures more exacting temperature control. Three-position switch on dryer compartment controls multi-bladed fan, quality shaded pole motor and auxiliary air heater. Pilot lights indicate bath and dryer compartment heater operation.

INSULATION: Bath compartment insulated with Fiberglas.

HEATER: Blue M Eterna type, black heat, in ribbed element plates. 325 watt capacity ample to maintain temperature at desired level. Slide dryer has its own 450 watt air heater which supplements water bath heater for fast slide drying.

TISSUE-BRITE ILLUMINATION: 12" long instant start fluorescent lamp mounted at approximately liquid level. Brilliantly illuminates bath and even smallest tissue. Wide front edge of bath housing is directly over lamp, forming a convenient location for pre-warming or air-drying slides.

STAINING RACKS: Three furnished. Glass. Each holds ten 1" X 3" glass microscope slides. 20 slides can be installed back to back. Stainless wire retaining clips hold slides regardless of position of racks. Racks are standard size to fit slide staining dish.

WIRING: Complete, meets N.E. Code, as amended. Unit comes ready to use with 3 wire 6 foot SJO heater cord, plug and strain relief.

Model Number	Bath Inside Dimensions Inches (Cm.)			Overall Dimensions Inches (Cm.)			Approximate Capacity Quarts (L)	Voltage 60 Hz. A.C. Single Phase	Total VA	Approximate Shipping Weight Lbs. (Kg.)	Complete Price
	L.	W.	D.	W.	D.	H.					
TB-610SDA (BATH & DRYER)	6 (15)	10 (25)	1½ (3)	12½ (32)	14⅜ (36)	10½ (26)	1½ (1.4)	120 V.	980	35 (16)	$296.00
TB-610A (BATH ONLY)	6 (15)	10 (25)	1½ (3)	12½ (32)	10 (25)	5½ (14)	1½ (1.4)	120 V.	400	30 (13)	195.00

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories.

GLASS STAINING RACKS: As described above.
Part No. M14-G2 ..... $6.25 Each

EXTRA FLUORESCENT LAMPS: As described above.
Part No. EO6D-2 ..... $6.00 Each

EXTRA FLOTATION DISHES: As described above.
Part No. M14-G3 ..... $5.00 Each

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly

BLUE M

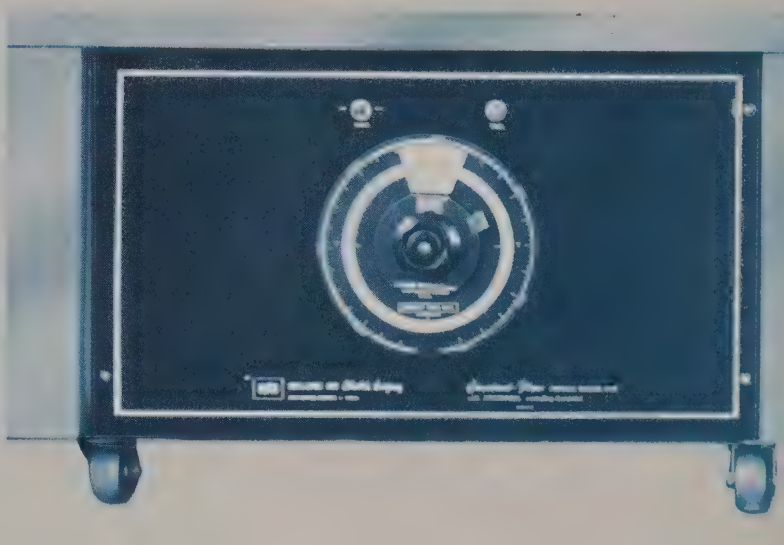
Constant-Flow

(PATENTED)

PORTABLE COOLING UNITS

3 CAPACITIES . . . 6 MODELS

±0.15°C. CONTROL FROM AMBIENT TO −23°C.



A MAJOR CONTRIBUTION TO THE ART OF RELIABLY PRODUCING SUB-AMBIENT LIQUID TEMPERATURES WITH MAXIMUM CONVENIENCE AND ECONOMY

For general industrial use . . . for service in laboratories —for specific jobs requiring on-the-spot cooling . . . for applications where supplementary cooling is sometimes necessary—for direct chilling of liquids . . . for auxiliary cooling of parts or components—these and other jobs can all be handled efficiently and economically with Blue M's Constant-Flow Portable Cooling Units. Incorporating a host of outstanding design and construction features, these quality units are available with capacities of 1800, 3400 and 5000 BTU/HR—a range that permits selection of the exact equipment for the job without costly overrating or ineffective underrating.

Heart of these units is Blue M's Constant-Flow Mechanical

EQUIPMENT COVERED BY OUR EXCLUSIVE
PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY

BLUE M

SEE PAGE 16

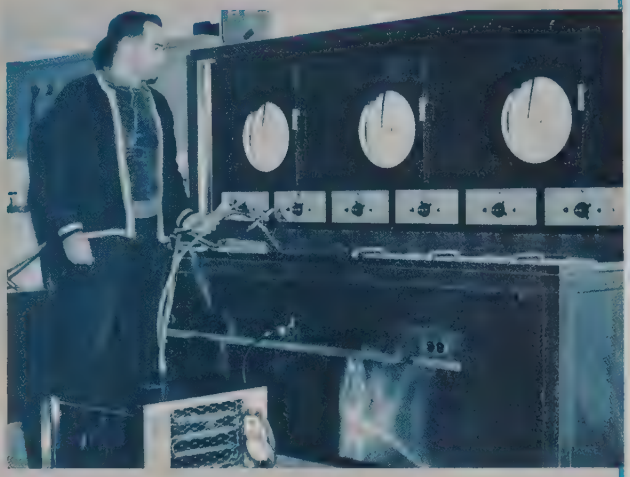
BLUE M

EXCLUSIVE HOT GAS BYPASS CAPACITY CONTROL PUTS BLUE M HEAD AND SHOULDERS ABOVE COMPETITION

Compressor capacity control is essential before a refrigeration system can maintain precise temperature over a wide range. Blue M's hot gas bypass system—coupled with the acknowledged advantages of a continuously operating compressor—assures you efficient, long-lasting service.

Essentially, the Blue M system bypasses the condenser with compressor discharge gas, preventing the compressor suction pressure from falling below a desired setting. Introducing the hot gas into the evaporator inlet immediately after the expansion valve has the effect of creating an artificial cooling load. This minimizes or eliminates the temperature undershoot common with similar equipment. Also, high velocities are maintained in the evaporator, keeping oil return to the compressor at a level to prevent the overheating and excessive wear which often occurs when other systems are used. In addition, the hot gas bypass system avoids the need for a thermal system heat source to stabilize at a temperature near or even slightly above ambient.

Blue M's hot gas bypass system and the many other quality features described on these pages all add up to a superior cooling facility which can be relied upon implicitly.



A wealth of refrigeration design and manufacturing experience has gone into the development of Blue M's Portable Cooling Units. Besides the finest materials and assembly by refrigeration experts, every unit undergoes thorough inspection and testing. Shown here is a specially designed test facility where the units are evacuated, charged, and tested individually before shipment. A typical unit is shown at left.

Refrigeration featuring an exclusive hot gas bypass capacity control circuit, described in detail above.

Accurate, reliable control is provided by Blue M's exclusive Microtrol. It offers ±0.15°C. control.

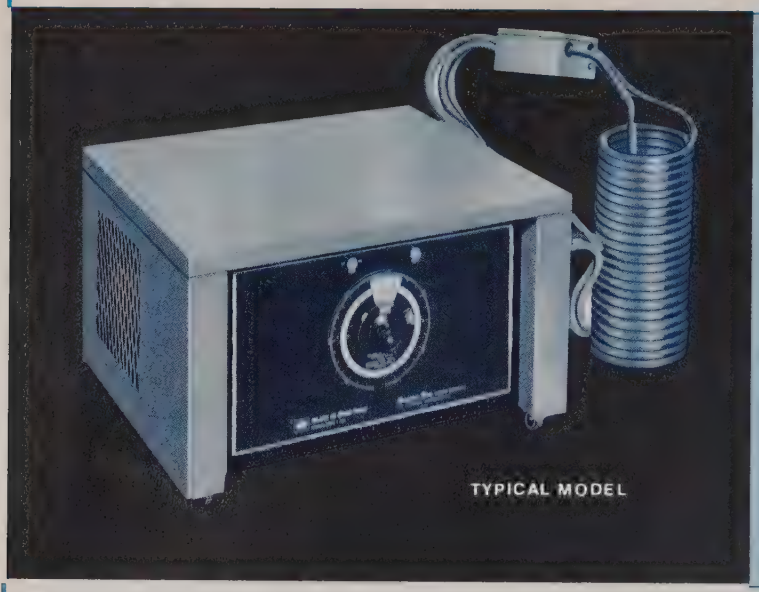
It works in conjunction with the patented Blue M Memory Ring® Temperature Calibrating Dial, the unique device that makes pin-point calibration of temperature easy and sure. The Memory Dial lets you zero-in on temperatures exactly and "remembers" every calibration factor for reproducibility. You get the exact temperature called for every time! Lock secures setting and prevents accidental changing

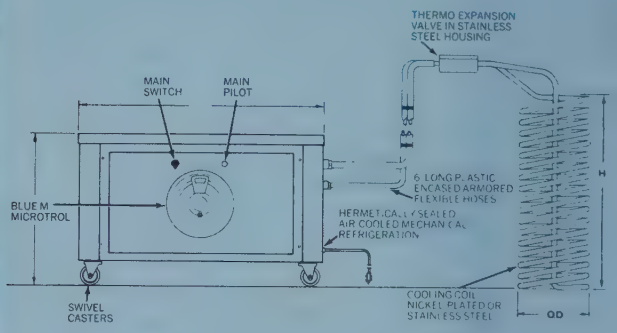
Refrigeration system and controls are housed in an attractive polished stainless steel cabinet with casters. Cooling coils are connected to the housing by 6 ft. long alloy flexible tubing encased in a tough plastic sheath. Flexibility permits coil placement as desired without moving compressor compartment.

Compare these Blue M units with any competitive make you can name. You'll quickly find that feature for feature —and dollar for dollar—there is no finer portable cooler on the market today!

Similar units with a range to −40°C. (−40°F.) are described on pages 124/125

BLUE M Electric Company CORPORATE HEADQUARTERS: BLUE ISLAND, ILLINOIS 60406




THERMO EXPANSION VALVE IN STAINLESS STEEL HOUSING
MAIN SWITCH
MAIN PILOT
6 LONG P. ASTIC ENCASED ARMORED FLEXIBLE HOSES
BLUE M MICROTROL
HERMETICALLY SEALED AIR COOLED MECHANICAL REFRIGERATION
SWIVEL CASTERS
COOLING COIL NICKEL PLATED OR STAINLESS STEEL
OD

PERFORMANCE CHARTS—ALL MODELS
WITH COPPER COOLING COILS

MODEL PCC-34C

CHART No. 1

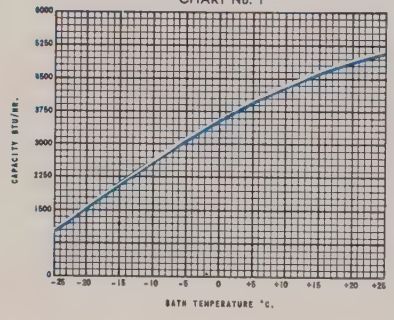
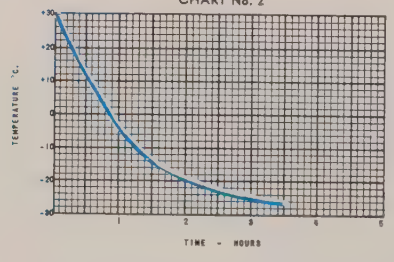


CHART No. 2



MODEL PCC-24A-3

CHART No. 1

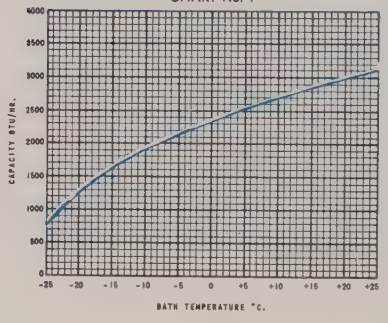
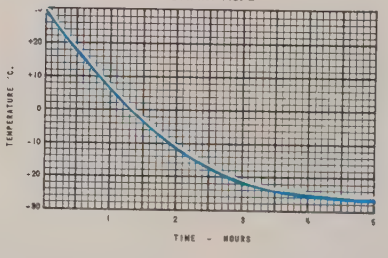
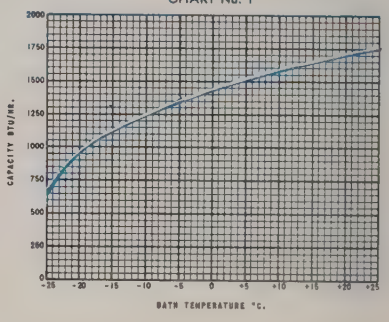


CHART No. 2



MODEL PCC-13A-3

CHART No. 1



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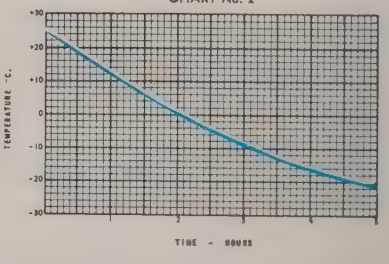


Top charts for each model show the total refrigeration system capacity for each model at the bath temperatures indicated. To find the net capacity or minimum temperature obtainable for a given application, subtract total heat gains of the application at desired bath temperature from above capacities.

Lower charts show pull-down time in 12" x 12" x 18" tank containing 10 gallons of 60% ethylene glycol solution. Tank had 2" of Fiberglas insulation. An external circulating pump added a live heat load of about 400 BTU/HR. NOTE: Charts apply to copper cooling coils only.

BLUE M

HOUSING: All polished stainless steel with adequate cross ventilating areas to assure proper air circulation. Four ball bearing swivel casters for mobility whenever required.

BLUE M MICROTROL: A custom designed hydraulic thermostat with operating sensitivity throughout the entire range. Models with stainless steel cooling coil feature a type 316 stainless sensing bulb and capillary. Those with nickel-plated copper coil have nickel-plated sensing bulb and capillary.

COOLING COILS: Nickel-plated copper or type 316 stainless steel, depending on model selected. (See specification chart below.) Thoroughly tested under pressure for leaks.

NOTE: Special cooling coils of various shapes and configurations are available on special request. Please submit your requirements for our review and quotation.

CONSTANT-FLOW MECHANICAL REFRIGERATION: Quality, hermetic type single-stage system using Refrigerant 12 and a thermostatic expansion valve as a metering device. Exclusive hot gas bypass capacity control circuit, described earlier, provides maximum efficiency under all operating conditions. Air-cooled by a separate heavy-duty motor driven fan to prevent overheating. System operates continuously.

FLEXIBLE HOSES: Connect cooling coil and compressor. 6' long alloy tubing encased for extra long life and safeguarded against abrasion with a tough plastic sheath. Coil can be placed as desired without moving compressor compartment.

NEON PILOT LAMP: Red, indicates unit operation.

MAIN SWITCH: On-off, toggle type, U.L. Listed.

WIRING: Complete, enclosed, meets amended N.E. Code. Six foot 3-wire line cord and plug. Units ready to use.

MODELS EQUIPPED WITH NICKEL-PLATED COPPER COOLING COIL

Model Number	*Capacity BTU/HR	Copper Coil Size Inches (Cm.)		Refrigeration Compartment O.D. Inches (Cm.)			Compressor H.P.	Voltage 60 Hz. A.C. Single Phase	Total VA	Shipping Weight Lbs. (Kg.)	Complete Price
		O.D.	H.	W.	D.	H.					
PCC-13A-3	1,800	7 (18)	16 (40)	24 (61)	20 (51)	15 (35)	1/3	120 V.	960	140 (63)	$625.00
PCC-24A-3	3,400	7 (18)	16 (40)	24 (61)	20 (51)	15 (38)	1/2	120 V.	1300	140 (63)	680.00
PCC-34C	5,000	7 (18)	19 (48)	28 (70)	23 (58)	19 (48)	3/4	†240 V.	1450	340 (154)	1025.00

MODELS EQUIPPED WITH TYPE 316 STAINLESS COOLING COIL**

Model Number	*Capacity BTU/HR	Stainless Coil Size Inches (Cm.)		Refrigeration Compartment O.D. Inches (Cm.)			Compressor H.P.	Voltage 60 Hz. A.C. Single Phase	Total VA	Shipping Weight Lbs. (Kg.)	Complete Price
		O.D.	H.	W.	D.	H.					
PCC-13SSA-3	Above capacities will be reduced to an amount varying with bath temp.	7 (18)	16 (40)	24 (61)	20 (51)	15 (35)	1/3	120 V.	960	140 (63)	$955.00
PCC-24SSA-3		7 (18)	16 (40)	24 (61)	20 (51)	15 (38)	1/2	120 V.	1300	140 (63)	992.00
PCC-34SSC		7 (18)	19 (48)	28 (70)	23 (58)	19 (48)	3/4	†240 V.	1450	340 (154)	1345.00

*Length of time and minimum temperatures obtainable are dependent on such variables as specific heat of the liquid, volume, surface area, insulation losses of the container, and whether liquid is agitated. Performance charts on previous page detail specific BTU/HR capacities for any bath temperature within the operating range of these units. Capacities shown above based on +25°C. bath temperature

**Recommended especially for use with sea water or other corrosive media.

†These models will operate reliably when connected to 208 volt service. 120 V. units available for 240 V. and 208 V./1 Ph. We will supply a separate autoformer package complete with line cord and plug. Simple installation

For Model Nos. PCC-13A-3 and PCC-13SSA-3
Specify Part No. E17E-1-1 ..... $90.00 Each

For Model Nos. PCC-24A-3 and PCC-24SSA-3
Specify Part No. E17E-1-2 ..... $120.00 Each

BLUE M

Constant-Flow
Patented

PORTABLE COOLING UNITS

TEMPERATURE RANGE
To -40°C. (-40°F.)

CONTROL TOLERANCE
±0.15°C.

CAPACITY
2000 BTU/Hr. at -30°F.

ALL PURPOSE
STAINLESS STEEL HOUSING

SELF-CONTAINED 1 H.P. MOBILE AIR-COOLED REFRIGERATION SYSTEM

COOL LIQUIDS TO -40°C. CONVENIENTLY AND EFFICIENTLY

The addition of this new unit to Blue M's already wide selection of Portable Coolers enables the laboratory specialist to chill or test liquids to as low as -40°C. (-40°F.) with equipment of proven design efficiency. A typical application is the testing of various natural gas properties at temperatures to -30°F. Here, the cooling coil is placed in a container of isopropyl alcohol equipped with a second coil with natural gas flowing from the source to an automatic gas analyzer. The cooling coil automatically maintains the temperature of the agitated liquid at the proper test level.

The unit is also ideal for such other work as direct chilling of liquids, auxiliary cooling of parts or components, for indirect chilling, and for innumerable other general applications in laboratories and industry.

Blue M's Constant-Flow Mechanical Refrigeration, featuring an exclusive hot gas bypass capacity control circuit described on the next page, is controlled by Blue M's own Microtrol control. It offers ±0.15°C. control, and operates in conjunction with the patented Memory Ring® Temperature Calibrating Dial which makes pinpoint temperature calibration easy and sure. The Memory Dial lets you zero-in on temperatures exactly, and "remembers" every calibration factor for future reproducibility. You get the exact temperature called for every time! Lock secures setting and prevents accidental changing.

An attractive polished stainless steel cabinet on casters houses refrigeration system and all controls. Cooling coil is connected to the housing by a 6-foot long flexible alloy tubing encased in tough plastic. Coil can be placed as desired without moving compressor cabinet.

Similar units for those needing a cooling capability to -23°C. are described on the preceding pages.

EQUIPMENT COVERED BY OUR EXCLUSIVE
PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

BLUE M

GENERAL SPECIFICATIONS AND PRICES

HOUSING: All polished stainless steel with adequate cross ventilating areas to assure proper air circulation. Four ball bearing swivel casters for mobility whenever required.

BLUE M MICROTROL: A custom designed hydraulic thermostat with operating sensitivity throughout the entire range. Models with stainless steel cooling coil feature a type 316 stainless sensing bulb and capillary. Those with nickel-plated copper coil have nickel-plated sensing bulb and capillary

COOLING COILS: Nickel-plated copper or type 316 stainless steel, depending on model selected. (See specification chart below.) Thoroughly tested under pressure for leaks.

NOTE: Special cooling coils of various shapes and configurations are available on special request. Please submit your requirements for our review and quotation.

CONSTANT-FLOW MECHANICAL REFRIGERATION: Quality 1 H.P. hermetic type single-stage Refrigerant 502 system. Thermostatic expansion valve serves as metering device. Exclusive hot gas bypass capacity control circuit, described at right, provides maximum efficiency under all operating conditions. Air-cooling by separate heavy-duty motor driven fan prevents overheating. System operates continuously.

HOT GAS BYPASS CAPACITY CONTROL: Exclusive from Blue M. System bypasses the condenser with compressor discharge gas, preventing compressor suction pressure from falling below desired setting. Introducing hot gas into evaporator inlet immediately after the expansion valve has the effect of creating an artificial cooling load. This minimizes or eliminates temperature undershoot common with similar equipment. Also, high velocities are maintained in the evaporator, keeping oil return to compressor at a level to prevent the overheating and excessive wear which often occurs with other systems. This system also avoids a thermal system heat source to stabilize at a temperature near or even slightly above ambient.

FLEXIBLE HOSES: Connect cooling coil and compressor. Six-foot long alloy tubing encased for extra long life and safeguarded against abrasion with a tough plastic sheath. Coil can be placed as desired without moving compressor compartment.

NEON PILOT LAMP: Red, indicates unit operation.

MAIN SWITCH: On-Off, toggle type, U.L. Listed.

WIRING: Complete, enclosed, meets amended N.E. Code. Six-foot 3-wire cord and plug. Units ready to use.

MODEL EQUIPPED WITH NICKEL-PLATED COPPER COOLING COIL

Model Number	Typical Coil Size* Inches (Cm.)		Refrigeration Compartment O.D. Inches (Cm.)			Compressor H.P.	Voltage 60 Hz. A.C. Single Phase	Total KVA	Shipping Weight Lbs. (Kg.)	Complete Price
	O.D.	H.	W.	D.	H.					
PCC-50C	7 (18)	19 (48)	28 (70)	23 (58)	19 (48)	1	†240 V.	1.5	340 (154)	$2635.00

MODEL EQUIPPED WITH TYPE 316 STAINLESS COOLING COIL**

Model Number	Typical Coil Size* Inches (Cm.)		Refrigeration Compartment O.D. Inches (Cm.)			Compressor H.P.	Voltage 60 Hz. A.C. Single Phase	Total KVA	Shipping Weight Lbs. (Kg.)	Complete Price
	O.D.	H.	W.	D.	H.					
PCC-50SSC	7 (18)	19 (48)	28 (70)	23 (58)	19 (48)	1	†240 V.	1.5	340 (154)	$2895.00

*As illustrated. Coil dimensions may be varied to fit individual requirements, but must be equal to above to provide the following unit capacity rating: 2000 BTU/Hr. at -30°F.

**Recommended especially for use with sea water or other corrosive media.

†These models will operate reliably when connected to 208-volt service. A 25% reduction in power will result.

Please note: length of time and minimum temperatures obtainable are a function of specific heat of liquid, volume, surface area, insulation losses of container, and whether or not liquid is agitated. Capacity rating shown is based on room temperature at +80°F or less, evaporator temperature of -46°F., and a coil heater transfer rate of 20 BTU's/sq. ft./°F.

BLUE M

Frigid-Tip™

PORTABLE COOLING PROBE

QUICKLY LOWERS LIQUID TEMPERATURES TO -35°C. (-31°F.)

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY BLUE M

SEE PAGE 16

THE EASIEST, MOST EFFICIENT WAY TO CHILL LIQUIDS IN SMALL VOLUMES EVER DEVELOPED

Here is the ideal unit for fast chilling of small liquid volumes in beakers, flasks, baths and similar laboratory containers. Simply place specially designed all-stainless probe into liquid and flip switch "on." Frigid-Tip immediately begins to lower liquid temperature. In minutes, extreme temperatures as low as -35°C. are reached—without ice, dry ice, or auxiliary equipment. Compact and completely self-contained, the unit is air-cooled—does not require water—operates independently of all other equipment. Simple, fast, versatile—it's the perfect choice for any laboratory needing a reliable limited-volume low temperature cooling source or a convenient means to cool larger volumes at higher temperatures.

GENERAL SPECIFICATIONS AND PRICES

HOUSING: All polished stainless. Two anodized aluminum handles for portability. Rests on four No-Mar rubber feet.

KWIK-KOLD COMPRESSOR SYSTEM: Exclusive proven design. Full 1/5 H.P. U.L. Listed hermetic type compressor provides fast pull-down. Uses Refrigerant 12. Air-cooled by separate, heavy duty motor driven fan. Will not overheat. System carefully inspected and fully tested to assure reliability.

FRIGID-TIP PROBE: 4" long and ⅞" in diameter, all stainless. Fits into flasks as small as those closed by a No. 5 rubber stopper (150 or 200 ml.) as well as other common laboratory containers.

FLEXIBLE METAL HOSE: 6 ft. long protected by plastic sheath. Flexibility facilitates probe placement in containers without moving compressor compartment.

MAIN SWITCH: U.L. Listed, on-off toggle type.

NEON PILOT LAMP: Red, indicates unit operation.

WIRING: Complete, enclosed, meets amended N.E. Code. Unit ready for use. 3 wire cord and plug.

Model Number	*Capacity	Cooling Probe Size Inches (Cm.)		Refrigeration Compartment O.D. Inches (Cm.)			Compressor H.P.	Voltage 60 Hz. A.C. Single Phase	Total VA	Shipping Weight Lbs. (Kg.)	Complete Price
		Dia.	L.	W.	D.	H.					
PCC-10A	1,000 BTU/HR at +25°C. (+77°F.)	7/8 (2.2)	4 (10)	15 (38)	16 (40)	14 (35)	1/5	120 V	400	100 (45)	$495.00

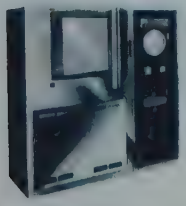
*Length of time and temperature obtainable are dependent on such variables as volume, surface area, container insulation, and liquid agitation. Rated capacity was obtained when liquid was agitated under normal operating conditions. The following figures will serve as a further guide to unit performance under these same conditions

BTU CAPACITY	OPERATING TEMP.
500 BTU/HR	+10°C. (+50°F.)
300 BTU/HR	0°C. (+32°F.)
50 BTU/HR	-25°C. (-13°F.)
10 BTU/HR	-30°C. (-22°F.)

BLUE M

Humid-Flow®
PATENTED
AIR-COOLED TEMPERATURE/HUMIDITY CHAMBERS
See Pages 128 and 129

SINGLE STEADY STATE TEMPERATURE/HUMIDITY CHAMBERS
See Pages 130 and 131



STEADY STATE HIGH TEMPERATURE/HUMIDITY CABINET
See Pages 132 and 133

vapor-temp®
(PATENTED)

VP-100 Series See Pages 134 and 135

VP-400 Series See Pages 136 and 137

BLUE M

ENVIRONMENTAL TESTING EQUIPMENT

NEW CONCEPTS! NEW SAFETY! NEW PERFORMANCE!
A MODEL "EXACTLY RIGHT" FOR YOUR SPECIFIC APPLICATION
All With Unusual Stability, Reliability, Accuracy and Reproducibility.

The units on the following pages are environmental cabinets which will duplicate conditions in the natural environment. While there are many types of equipment that fall into this category, we are primarily concerned with the environmental characteristics of temperature and humidity—individually or in combination.

The basic system of humidity control is identical in the cabinets we have available, but these units vary in size, cost, source of cooling and instrumentation. The purpose of this introduction is to help you decide which will be best for your application. Overtemperature protection is standard on them all

The Blue M HUMID-FLOW Air-Cooled Temperature/Humidity Chamber is unique . . . in concept, in design, in operating economy. It utilizes stable ambient air temperature as the cooling medium, assures extremely accurate reproduction of conditions in test chamber, yet can save thousands of gallons of water annually. Also eliminates costly compressors . . . cuts operating power requirements to the bone. Ideal for single steady state testing—including MIL-202D, Method 103B, Condition D, continuous operation for 56 days. Separate POWER-O-MATIC 60® Wet and Dry Bulb Control Systems assure reliability and accuracy.

Blue M Single Steady State Temperature/Humidity Cabinet provides many note-worthy features including dual POWER-O-MATIC 70® Solid-State Proportioning Control Systems to regulate temperature and humidity. Designed to perform a wide range of different steady state tests, this quality unit is suitable for both industrial and military specification testing. Recommended particularly for continuous duty testing of small low volume components which do not dissipate any substantial amounts of heat, they come with a separate 2-pen wet and dry bulb monitoring recorder and a built-in, self-contained refrigeration system for sub-ambient testing.

Newest addition to our line is the Steady State Constant High Temperature and Humidity Cabinet featuring a unique "self-cleaning" design. Utilizing a one-pass air-flow system which almost literally sweeps the chamber clean, the unit eliminates the build-up of corrosive contaminants in the work chamber while providing extremely reliable operation with large volume high temperature, high humidity capabilities. This system also serves as an efficient coolant, eliminating compressors. The unit provides a wide humidity range when operating at elevated temperatures. POWER-O-MATIC 60 Control assures reliable, accurate performance.

The Blue M VAPOR-TEMP Relative Humidity Chamber, VP-100 Series, offers every scientific laboratory an essential tool at a price it can well afford. These units and the similar VP-400 Series described below, feature solid-state SCR switching on wet and dry bulb circuits to eliminate all relays—and relay failure! Improved cooling coil design eliminates need for tap water cooling in 90% of all applications.

The VP-400 is a modification of the VP-100, but has mechanical refrigeration. The range of this unit is extended to +40°F. and will operate at lower humidities at lower dry bulb temperatures. Purchase this unit when: 1) Temperatures at the below room temperatures are required, 2) Lower humidities at room temperatures are required, 3) Tap water conditions are extremely corrosive, causing an excess fo maintenance with water-cooled equipment, 4) Tap water temperatures are abnormally high.

The performance of all Blue M cabinets is certified and approved in test laboratories throughout the world. Blue M Electric Company is a member of the Institue of Environmental Sciences and other organizations dedicated to the art of environments.

NOTE: Many models meet ASTM Specifications. A list of the specs. is shown on page 182/183

BLUE M *Electric Company* CORPORATE HEADQUARTERS: BLUE ISLAND, ILLINOIS 60406

BLUE M

Humid-Flow®

(PATENTED)

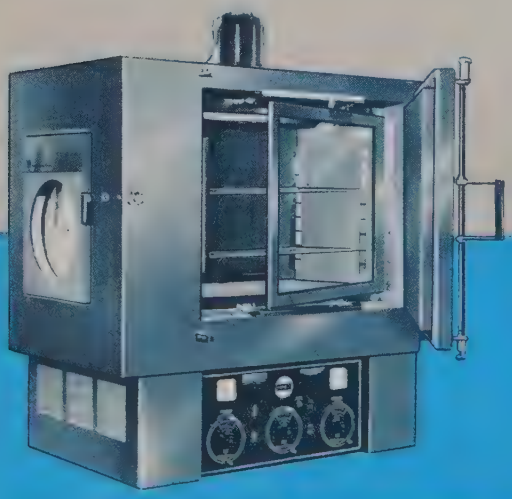
AIR-COOLED COMBINATION TEMPERATURE AND HUMIDITY CABINETS

with

POWER-O-MATIC 60® PATENTED

saturable reactor proportioning control system and built-in overtemperature protection

LOW WATER CONSUMPTION
Uses less than a gallon a day
WET AND DRY BULB 2 PEN RECORDER
Monitors and provides records
BUILT-IN OVERTEMPERATURE PROTECTION
ELAPSED TIME METER
SOLID-STATE WATER LEVELER
Adjustable . . . assures precise control
STEADY STATE VERTICAL AIR-FLOW
VAPOR PRESSURE SYSTEM
No wet bulb control wick to change
MEMORY RING® TEMPERATURE CALIBRATING DIAL AND DIAL POINTER LOCK
USE AS A WET TYPE INCUBATOR



EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY

SEE PAGE 16

EXCLUSIVE AIR-COOLED DESIGN NO COMPRESSORS, NO TAP WATER COOLING SYSTEMS. AIR DOES THE WORK . . . NOT COSTLY CONDITIONED WATER!

The most accurate, reliable and economical chamber available for long-term high temperature/humidity testing. Ideal for such steady-state requirements as MIL-202D, Method 103B, Condition D—continuous operation for 56 days.

By eliminating compressor and tap water circulating systems, Blue M has eliminated such components as solenoid valves and timers. Ambient room air temperature in most laboratories is more stable than varying tap water temperatures, making chamber conditions equally stable. This, coupled with the inherent reliability of the independent wet and dry bulb POWER-O-MATIC 60 Saturable Reactor Control systems, assures unusual accuracy.

While the cabinet range (see chart) is limited as compared to other models, minimal power requirements and insignificant water consumption sharply reduce operating cost. Specially designed motor/blower cooling system for heat exchange compartment, under control of a separate switch, is not even needed for many standard tests—cutting operating expense still more.

AUTOMATICALLY CONTROLS HUMIDITY
From *40% to 98% (±½%)
*(See chart for exact conditions possible)
AUTOMATICALLY CONTROLS DRY BULB
From +12°C. above ambient to +93°C. (±½°C.)

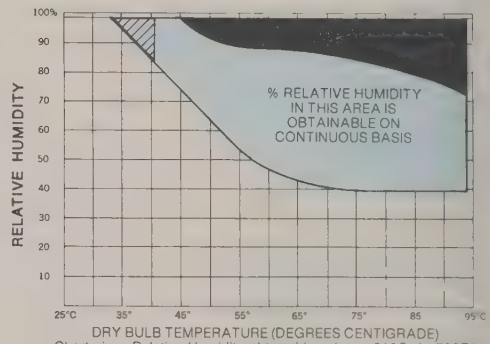
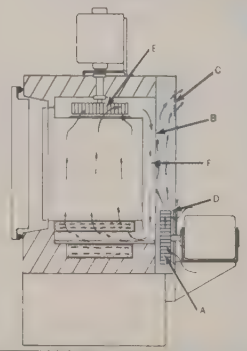


Chart gives Relative Humidity obtainable using +21°C. (+70°F.) ambient air as the cooling medium
NOTE: Area in solid black indicates percentage of Relative Humidity which can be accurately controlled with the motor blower which propels the cooling air being OFF. Hatch-marked area is variable depending upon ambient temperature



HERE'S HOW IT WORKS

High efficiency blower system (A) drives ambient air through uniquely designed rear cavity, across rear heat exchanger chamber wall plate (B) and outward through vents (C) near top of cabinet. Cooling air is proportioned by damper (D). This reduces temperature of entire rear inner chamber wall surface. Internal blower system (E) forces internal air through rear plenum chamber (F), and air is cooled and controlled to proper dew point as it contacts rear wall (B). Air is then saturated and reheated to set conditions. NOTE: Cooling air does not contact conditioned air within work chamber

BLUE M

SEE PAGES 10-15 FOR FULL DESCRIPTION OF PATENTED POWER-O-MATIC 60 CONTROL SYSTEM

GENERAL SPECIFICATIONS AND PRICES

CONSTRUCTION: Double wall bench type. Type 316, 17-12 electropolished stainless interior for excellent corrosion resistance. Polished 18-8, type 304 stainless exterior.

INSULATION: Fiberglas wool 3 in. thick on all chamber sides except rear wall.

DOORS AND HARDWARE: Double wall outer door with exclusive adjustable no-slam cam action latch and chrome-plated adjustable hinges maintains air-tight seal. Inner door (one piece, heavy clear glass in 18-8 stainless frame with silicone tube seal) has easy to open and close SURE-LOCK alloy pressure latches. No vapor leakage.

SHELVES (2): Stainless; wire type electropolished. Removable and adjustable in 1⅞" steps.

OVERTEMPERATURE PROTECTION: Built-in, to protect workload and equipment.

ELAPSED TIME METER: Shows hours chamber operates.

LEAD-IN PORT: 3 in. dia. stainless with rubber plug. Located in right side wall.

COMPLEMENTARY MOTOR/BLOWER SYSTEMS: Work with one another for optimum performance (see drawing). One circulates cooling ambient air across surface of rear heat exchanger chamber wall; one circulates conditioned air through chamber. Alloy multi-blade blowers, dynamically and statically balanced, powered by heavy-duty ballbearing motors through alloy shafts and seals.

OVERLOAD PROTECTION: Built-in, thermal overload protection starter insures safety of both motors.

COOLING CHAMBER AIR-FLOW PATTERN: Blower system forces air through cavity of rear chamber, across heat exchanger wall surface, and outward through vents at top. This suppresses temperature of entire rear inner wall.

WORK CHAMBER AIR-FLOW PATTERN: Internal blower system forces air through plenum rear chamber vertically where it is cooled to proper dew point on contact with rear wall heat exchanger plate.

ADJUSTABLE AIR VOLUME: 0 to 30 complete changes of entire work chamber volume per minute.

DEMINERALIZING CARTRIDGE: Assures high purity water for many weeks operation. Minimizes corrosion.

WET AND DRY BULB MODELLA ELEMENTS: Designed especially for long temperature/humidity cabinet service. Separate POWER-O-MATIC 60 controls for wet and dry bulb elements assure pin-point accuracy.

WET AND DRY BULB MONITORING RECORDER: 12 in. dia. Range: −18°C. to +93°C. Complete with 2 pens, 100 charts, distilled water feed, accessories. Accuracy: ±1% of scale range. Calibrated at +65°C., ±½°C. Not connected electrically or mechanically to control system. Monitors and provides records only. 24-hour model standard.

UNIQUE SOLID-STATE WATER LEVEL SYSTEM: Adjustable for precise level control. No water wasted. Quality "Y" type strainer, pressure regulator valve, flow control solenoid valve. Meters water exactly on long-term basis. Alloy water receptacle permits visual inspection. Overflow tube avoids water overflow.

(2) VOLTMETERS: Voltmeters indicate voltage impressed across elements.

WIRING: Complete and totally enclosed. Meets N.E. Code, as amended. Terminal box provided.

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Total KVA	Voltage 60 Hz. A.C. Single Phase	Cubic Feet Capacity	Shipping Weight Lbs. (Kg.)	†Complete Price With Recorder And OTP	(Optional) Cabinet Type Floor Stand Enameled Steel (Cat. No.)
AC-7402HA-1	14 (35)	13 (33)	†14 (35)	32 (80)	34 (86)	48 (120)	1.7	**120 V.	1.47	340 (154)	$3370.00	(FS-116) $105.00
AC-7502HA-1	20 (51)	14 (35)	†20 (51)	38 (95)	35 (88)	54 (136)	2.7	**120 V.	3.24	500 (227)	3840.00	(FS-117) 135.00
AC-7602HA-1	25 (63)	19 (48)	†20 (51)	43 (108)	40 (101)	54 (136)	2.7	**120 V.	5.50	650 (295)	4590.00	(FS-118) 155.00
*AC-7702HB-1	37 (93)	19 (48)	†25 (63)	55 (139)	40 (101)	59 (148)	4.0	208 V.	10.00	840 (381)	5985.00	(FS-119)
*AC-7702HC-1								240 V.			5880.00	170.00

*Double outer doors, no center mullion †Includes 24-hour Wet & Dry Bulb Recorder described

**Available for 240 V. and 208 V./1 Ph. We will supply a separate autoformer package complete with line cord and plug. Simple installation
For Model AC-7402HA-1 specify Part No. E17E-1-2..... $120.00 Each
For Models AC7502HA-1 & AC-7602HA-1 specify Part No. E17E-1-3.. $210.00

†First shelf position for test specimens is 2¾ inches above bottom air diffuser plate. Placement of test specimen on other than shelves is not recommended

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories

EXTRA DEMINERALIZING CARTRIDGE: Assures water used in cabinet is highly purified. Effective for many weeks operation. Suitable for cabinet proper.
Cat. No. M18-D2..... $32.00 Each
Lots of 6..... $28.50 Each

EXTRA CHARTS: Per box of 100 ..... $10.50 Each
Specify: Part No. C10A-4-1 (°C.—24 Hr.); Part No. C10A-4-3 (°F.—24 Hr.).

EXTRA WICKS AND PENS: For recorder.
Wicks: Part No. C10F-1 ..... $14.00/Doz.
Pens: Part No. C10D-4-1 ..... $29.50/Set

NEW HUMID-PAC ACCESSORY KIT: Everything you need to keep your chamber operating for a year under normal use. Avoids down-time, saves time, effort, money! SEE PAGE 170 FOR FULL DETAILS AND ORDERING INFORMATION.

CRYSTAL-CLEAR WATER PURIFICATION SYSTEM: Combats corrosion, chief cause of chamber down-time; provides pure water free of impurities. Includes 48 gallon stainless reservoir, cover, demineralizer cartridge, filter, pump, valve and piping. Single filling lasts several weeks. Specify Cat. No. WP-4800..... $678.00 Each

EXTRA SHELVES: As described above.

For Series Number	Shelf Part Number	Price Each
AC-7402	MO4-A112	$23.00
AC-7502	MO4-A111	37.00
AC-7602	MO4-A110	54.00
AC-7702	MO4-A137	83.00

NOTE: Each cabinet includes a RELATIVE HUMIDITY and TEMPERATURE CONVERSION SLIDE CHART

BLUE M

SINGLE STEADY STATE COMBINATION TEMPERATURE AND HUMIDITY CABINET

with

POWER-O-MATIC-70®
PATENTED

solid-state proportioning control system, separate monitoring recorder and mechanical refrigeration

STABILIZATION TIME
+25°C. to +93°C.: 60 minutes
+93°C. to +25°C.: 60 minutes
+25°C. to +3°C.: 30 minutes

WET AND DRY BULB 2 PEN RECORDER
Monitors and provides records

VAPOR PRESSURE SYSTEM
No wet bulb control wick to change

VERTICAL MECHANICAL AIR-FLOW

BUILT-IN OVERTEMPERATURE PROTECTION

ELAPSED TIME METER

MEMORY RING* TEMPERATURE CALIBRATING DIAL AND DIAL POINTER LOCK

IDEAL FOR USE WITHOUT HUMIDITY FOR SUB-AMBIENT TESTS DOWN TO +3°C.

EQUIPMENT COVERED BY OUR EXCLUSIVE
PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM
WARRANTY
BLUE M
SEE PAGE 16

IMPROVED REFRIGERATION SYSTEM NOW INSURES LONG-TERM RELIABILITY PLUS EXCELLENT STABILITY AND ACCURACY FOR STEADY STATE TESTING WITHIN A WIDE TEMPERATURE/HUMIDITY RANGE

These new mechanical convection, vertical air-flow cabinets put all the advantages of Blue M's patented POWER-O-MATIC 70 Solid-State Proportioning Control System (described fully on pages 12-13) to work accurately regulating temperature and humidity within the range shown in the chart.

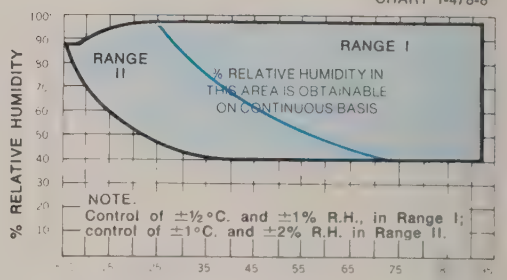
Features include an improved built-in, self-contained refrigeration system for sub-ambient testing without tap water; a separate 2 pen wet and dry bulb monitoring recorder; independent wet and dry bulb POWER-O-MATIC 70 Control Systems; built-in overtemperature protection. The unusual stability and accuracy of these quality cabinets insure their testing reliability, making them a valuable addition to your environmental testing facility.

RECOMMENDED FOR: RELIABLE CONTINUOUS DUTY TESTING OF SMALL, LOW VOLUME COMPONENTS WHICH DO NOT DISSIPATE ANY SUBSTANTIAL AMOUNTS OF HEAT; FOR STEADY STATE TESTS; PAINT AND PROTECTIVE COATING SAMPLE TESTING; WATER VAPOR TRANSMISSION; PACKAGING TESTS; CHEMICAL AND FOOD TESTS; INSULATING MATERIALS TESTS; AND FOR THE SPECIFIC CEMENT AND CORROSION TESTS LISTED BELOW.

USE FOR CEMENT AND CORROSION TESTS
Partial List of ASTM Tests
- C 87 Measuring Mortar Properties
- C 109 Compressive Strength
- C 191 Setting Time Hydraulic Cement
- C 190 Tensile Strength

AUTOMATICALLY CONTROLS HUMIDITY
From *40% to 98% (±1%)
(*See chart for exact conditions possible)
AUTOMATICALLY CONTROLS DRY BULB
From +3° to +93°C. (±½°C.)

CHART I-478-8



DRY BULB TEMPERATURE (DEGREES CENTIGRADE)
Chart gives Relative Humidity obtainable using unit's built-in mechanical refrigeration system with an external ambient temperature from +21°C. to +27°C.

BLUE M

SEE PAGES 12-13 FOR FULL DESCRIPTION OF PATENTED POWER-O-MATIC 70 CONTROL SYSTEM.

GENERAL SPECIFICATIONS AND PRICES

CONSTRUCTION: Double wall type. Type 316, 17-12 stainless interior for excellent corrosion resistance. Polished 18-8, type 304 stainless exterior.

INSULATION: Fiberglas; 3" thick on all chamber sides.

DOORS AND HARDWARE: Double wall outer door with no-slam cam action latch, chrome-plated adjustable hinges and silicone seal for air-tight closure. Inner door (one piece, heavy plate clear glass in 18-8 stainless frame with silicone tube seal) has easy to open and close SURE-LOCK alloy pressure latches. No vapor leakage.

LEAD-IN PORT: For entrance of electrical cables, etc. 3" diameter stainless with rubber stopper. Located in right side wall.

SHELF: Stainless; wire type, electropolished. Adjustable in 1⅛ in. steps to 7 positons.

ELAPSED TIME METER: Shows actual number of hours chamber operates.

WET AND DRY BULB MONITORING RECORDER: 12 in. dia. Range: -18°C. to +93°C. Complete with 2 pens, 100 charts, distilled water feed, and accessories. Total accuracy: ±1% of scale range. Not connected electrically or mechanically to control system. Monitors and provides records only. 24-hour model standard.

UNIQUE SOLID-STATE WATER LEVEL SYSTEM: Adjustable for precise level control. No water wasted. Consists of quality "Y" type water strainer, flow control solenoid valve. Meters water exactly on long-term reliable basis. Alloy water receptacle permits visual inspection. Overflow tube protects against any possible water overflow.

BUILT-IN DIRECT LINE OVERTEMPERATURE PROTECTION: Protects chamber and workload against excessive temperature rise.

DEMINERALIZING CARTRIDGE: Provides high purity water for cabinet. With average water, many weeks of cartridge life is possible. Minimizes corrosion and prevents contamination of specimens.

WET BULB RECORDER WICK CONTAINER: ½ gallon bottle in stainless rack. Gravity feed.

WET AND DRY BULB MODELLA ELEMENTS: Designed especially for long life. Nickel-chromium helical coils supported by special framing and refractories. Separate POWER-O-MATIC 70 controls for wet and dry bulb elements assure pin-point accuracy to strictest requirements.

CABINET FLOOR STAND: Heavy cold rolled steel. Blue enamel finish. Houses mechanical refrigeration system.

MECHANICAL REFRIGERATION: Dual circuit cooling system, non-cycling for longer life. Quality type; uses refrigerant 12. Ample capacity for cabinet range.

REFRIGERATION PRESSURE GAUGES (2): Monitor high side pressure and low side pressure of compressor.

VAPOR PRESSURE SYSTEM: In lieu of atomizing spray. No wet bulb control wicks to change.

MOTOR/BLOWER AND OVERLOAD PROTECTION: Electropolished stainless, multi-blade blower, statically balanced; powered by heavy duty motor through stainless shaft and seal. Thermal overload protection insures motor safety.

AIR-FLOW PATTERN: Low velocity air convected vertically across heaters and water reservoir before entering work chamber.

ADJUSTABLE AIR VOLUME: Up to 200 FPM velocity.

NEON PILOT LAMPS (3): Detail operations; heaters, compressor and water flow.

(2) VOLTMETERS: Indicate voltage across elements.

WIRING: Complete and totally enclosed. Meets N.E. Code, as amended. Terminal box provided.

Model Number	Inside Dimensions Inches (Cm.) W.	D.	†H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Voltage 60 Hz. A.C. Single Phase	Cubic Feet Capacity	Total KVA	Shipping Weight Lbs. (Kg.)	Complete Price with 24-Hour Recorder
POM-7570C-1	20 (51)	14 (35)	†20 (51)	38 (95)	32 (80)	79 (205)	*240 V.	3.2	5.2	800 (363)	$6590.00

*Tap provided for 208 V./1 Ph. operation
†First shelf position for test specimen is 2½ inches above bottom air diffuser plate. Placement of test specimen on other than shelves is not recommended
NOTE: Each cabinet includes a RELATIVE HUMIDITY AND TEMPERATURE SLIDE CHART

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories

EXTRA DEMINERALIZING CARTRIDGE: Assures water used in cabinet is highly purified and prevents contamination of test specimen.
Part No. M18-D2 ..... $32.00 Each
Lots of 6 ..... $28.50 Each

EXTRA CHARTS: Per box of 100 ..... $10.50 Each
Specify: Part No. C10A-4-1: °C.—24 Hour
Part No. C10A-4-3: °F.—24 Hour

EXTRA WICKS AND PENS: For recorder
Wicks: Part No. C10F-1 ..... $14.00/Doz.
Pens: Part No. C10D-4-1 ..... $29.50/Set

NEW HUMID-PAC ACCESSORY KIT: Everything you need to keep your chamber operating for a year under normal use. Avoids down-time, saves time, effort, money! SEE PAGE 170 FOR FULL DETAILS AND ORDERING INFORMATION.

CRYSTAL-CLEAR WATER PURIFICATION SYSTEM: Combats corrosion, chief cause of chamber down-time; provides pure water free of impurities. Includes 48 gallon stainless reservoir, cover, demineralizer cartridge, filter, pump, valve and piping. Single filling lasts several weeks. Ready to operate.
Specify Cat. No. WP-4800 ..... $678.00 Each

EXTRA SHELF. As described above.
Part No. MO4-A111 ..... $37.00 Each

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly.

BLUE M

STEADY STATE CONSTANT HIGH TEMPERATURE AND HUMIDITY CABINET

with

POWER-O-MATIC-60® PATENTED

saturable reactor proportioning control system, separate monitoring recorder, and built-in overtemperature protection

WET AND DRY BULB 2-PEN RECORDER
Monitors and provides records

BUILT-IN OVERTEMPERATURE PROTECTION

ELAPSED TIME METER

ONE-PASS AIR-FLOW SYSTEM

SOLID-STATE WATER LEVELER

VAPOR PRESSURE SYSTEM
No wet bulb control wicks to change

MECHANICAL HORIZONTAL AIR-FLOW

MEMORY RING® TEMPERATURE CALIBRATING DIAL AND DIAL POINTER LOCK

A SUPERIOR CABINET FOR CRITICAL PERFORMANCE UNDER HIGH TEMPERATURE AND HUMIDITY CONDITIONS

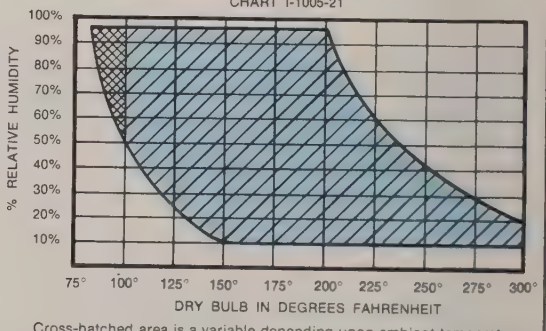
This all-new cabinet offers the scientific and laboratory field a unique "self-cleaning" design which eliminates the build-up of corrosive contaminants in the work chamber. Utilizing a one-pass air-flow system which almost literally sweeps the chamber clean, the unit provides extremely reliable operation with large volume high temperature, high humidity capabilities. It is ideal for processing silicone rubber compounds and other products requiring a high moisture content for thorough, rapid curing, and for testing both rigid and flexible methanes. In such cases, the one-pass air-flow system prevents the fume and contaminant build-up inherent in conventional sealed-chamber designs.

The one-pass air-flow system also serves as an efficient coolant, eliminating compressors—and attendant high compressor wear when chambers operate continuously at high temperatures. This unit also provides a much wider humidity range (see chart) when operating at these elevated temperatures.

AUTOMATICALLY CONTROLS HUMIDITY
From 10% to 98%
(See chart for exact conditions possible.)
Accuracy: ±1% (80-90% R.H.)
±3% (Below 80% R.H.)

AUTOMATICALLY CONTROLS DRY BULB
From 3°C. above ambient to +150°C. (±1.0°C.)

CHART I-1005-21



Cross-hatched area is a variable depending upon ambient temperature. Reliable control is obtained at 5°F. above ambient. Right-hand curve represents maximum R.H. obtainable at atmospheric pressure at temperatures above +200°F. and corresponds with a constant dew point of approximately +205°F. Approximate water consumption at a condition of +200°F., 98% R.H. and minimum exhaust setting is 1 Gal./Hour Chart based on ambient air at +85°F., 50% R.H.

EQUIPMENT COVERED BY OUR EXCLUSIVE
PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY BLUE M

SEE PAGE 16

BLUE M

SEE PAGES 10-15 FOR FULL DESCRIPTION OF PATENTED POWER-O-MATIC 60 CONTROL SYSTEM

GENERAL SPECIFICATIONS AND PRICES

CONSTRUCTION: Double wall. Heli-arc welded and passivated Type 316, 17-12 stainless interior. Polished stainless heli-arc welded exterior.

INSULATION: Fiberglas; 3" thick on all chamber sides.

DOORS AND HARDWARE: Double wall outer door with exclusive adjustable no-slam cam action latch and adjustable chrome-plated hinges. Silicone rubber seal. Inner solid stainless door with stainless latches and fittings helps maintain desired chamber environment.

SHELVES (2): Electropolished stainless wire type, adjustable in 2" steps.

OVERTEMPERATURE PROTECTION: Built-in, to protect workload and equipment.

ELAPSED TIME METER: Shows actual number of hours chamber operates.

ADJUSTABLE ONE-PASS AIR-FLOW SYSTEM: Designed to provide efficient chamber cooling without compressors.

DEMINERALIZING CARTRIDGE: Assures high purity water for many weeks operation. Minimizes corrosion.

UNIQUE SOLID-STATE WATER LEVEL SYSTEM: Adjustable for precise level control. Quality "Y" type strainer, pressure regulator valve, flow control valve. Meters water exactly on long-term basis. Alloy water receptacle permits visual inspection. Overflow tube avoids water overflow.

WET AND DRY BULB MONITORING RECORDER: 12 in. dia. Ranges: -50° C. to +150° C. or -60° F. to +300° F. Complete with 2 pens, 100 charts, distilled water feed, accessories. Accuracy: ±1% of scale range. Not connected electrically or mechanically to control system. Monitors and provides records only. 24-hour model standard.

CONSOLE INSTRUMENT CABINET: Heavy gauge cold-rolled steel houses all instrumentation. Attractive blue enamel finish.

VOLTMETERS (2): Indicate voltage impressed across elements.

WIRING: Complete and enclosed, meets amended N.E. Code. Terminal box.

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Total KVA	Voltage 60 Hz. A.C.	Capacity (Cu.Ft.)	Shipping Weight Lbs. (Kg.)	Complete Price
HR-251B	25 (63)	20 (51)	20 (51)	72 (183)	38 (95)	70 (177)	6.0	208 V./1 Ph.	5.8	1100 (499)	$6965.00
HR-251C								240 V./1 Ph.			6815.00

OPTIONAL AND RECOMMENDED ACCESSORIES — SPARE PARTS

Please give unit model no. and voltage when ordering accessories

EXTRA DEMINERALIZING CARTRIDGE: Assures water used in cabinet is highly purified. Effective for many weeks operation. Suitable for cabinet proper.
Part No. M18-D2 ..... $32.00 Each
Lots of 6 ..... $28.50 Each

EXTRA CHARTS: Per box of 100 ..... $11.50 Each
Specify: Part No. C10A-4-5 (°C.—24 Hr.);
Part No. C10A-4-7 (°F.—24 Hr.)

EXTRA WICKS AND PENS: For recorder.
Wicks: Part No. C10F-1 ..... $14.00/Doz.
Pens: Part No. C10D-4-1 ..... $29.50/Set

CRYSTAL-CLEAR WATER PURIFICATION SYSTEM: Combats corrosion, chief cause of chamber down-time; provides pure water free of impurities. Includes 48-gallon stainless reservoir, cover, demineralizer cartridge, filter, pump, valve and piping. Single filling lasts several weeks.
Specify Cat. No. WP-4800 ..... $678.00 Each

EXTRA SHELVES: As described above.
Specify Part No. MO4-A110 ..... $54.00 Each

NOTE Each cabinet includes a RELATIVE HUMIDITY and TEMPERATURE CONVERSION SLIDE CHART

BLUE M

vapor-temp®

(PATENTED)

Bench Type

CONTROLLED TEMPERATURE AND HUMIDITY CHAMBERS

with built-in overtemperature protection

CONTROLS HUMIDITY: 20% to 98%. (±1%)

CONTROLS DRY BULB: From Room to +77°C. (±½°C.) See chart on opposite page for exact conditions.

UNIQUE ADVANTAGES INCLUDE: Full visibility, full accessibility, fully automatic: complete with accessories.

FAST: Reaches any condition within range in 20 minutes.

HIGH HUMIDITY, NO CONDENSATION ON WORK LOAD.

VAPOR PRESSURE SYSTEM—NO WET BULB CONTROL WICK TO CHANGE.

SHIELDED CHAMBER—NO DIRECT RADIATION.

NO MECHANICAL REFRIGERATION* NECESSARY WHEN OPERATING WITHIN CONDITIONS SHOWN BY CHART.

2 INCH STAINLESS STEEL CIRCULAR RING: Adds work height, permits added terminal connections or lead-ins.

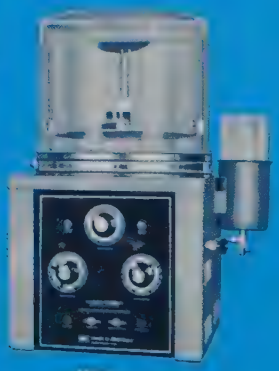
DISTILLED WATER SHOULD BE USED.

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY

SEE PAGE 16

Model VP-100RAT-1



Model VP-100AT-1

COMPLETELY REDESIGNED FOR GREATER RELIABILITY!

SOLID-STATE SCR SWITCHING ON WET AND DRY BULB CIRCUITS!
Eliminates all relays—and failure! Minimizes microswitch failure. Chief cause of down-time practically eliminated . . . making these already proven units even more reliable. To provide visual evidence of actual performance a high quality 2 pen monitoring recorder is supplied with VP-100RAT-1. A worthwhile recommended accessory for long term unattended test programs. Factory installed on side of cabinet type floor stand.

COOLING COIL DESIGN—ELIMINATES NEED FOR TAP-WATER COOLING IN 90% OF APPLICATIONS!
Over a range of approximately +35°C./98% R.H. through +77°C./50%-100% R.H. extremely stable control is obtained without tap water. This means that for at least 90% of all applications for these units, tap water line and drain connections are not needed. (See chart on opposite page). Quality solenoid water valve still supplied but under control of on-off switch. Place in use only when test programs require tap water.

PATENTED MEMORY RING® DIAL—FOR EASY, PIN-POINT TEMPERATURE CALIBRATION!
Lets you zero-in on all temperatures, or those you use most, with laboratory exactness—"remembers" every calibration factor for you. You get the exact temperature called for every time. Standard dial graduated in degrees Centigrade. Control panel recessed . . . controls simplified; makes unit easier than ever to use!

CONDUCT MANY TESTS AT ONCE AT LOWEST COST!
Here is an accurate and versatile annular Mechanical Convection Controlled Temperature and Humidity Chamber priced to fit the budget of any research laboratory. Using an inverted Pyrex Jar (16 in. Dia. x 12 in. H.) as the working chamber, Blue M eliminates the cost of expensive double alloy cabinets. Stainless cabinet houses all controls, heavy duty motor, alloy blower, cooling coil and solenoid valve. No doors to seal, no leakage, no corrosion. Performance guaranteed better than humidity cabinets costing many times more!

MAY BE USED AS A DRY TYPE MECHANICAL CONVECTION OVEN . . . ROOM TO +77°C.
IDEAL FOR MANUFACTURE OF RELAYS, CAPACITORS, TRANSISTORS, TRANSFORMERS, MOTORS, TIMERS, WIRE AND CABLE, FILTERS, RECTIFIERS, PRINTED CIRCUITS, ETC. Also for many applications in Biological and Pharmaceutical Fields, Public Health Departments, Dairy Industry, Water and Sewage Test Laboratories, Hospital and Clinical Laboratories, Medical Schools, Agricultual Experiment Stations.

*If adverse ambient conditions and/or widely fluctuating tap water temperatures are present, we recommend our VP-400A-1 series with mechanical refrigeration See next page

TYPICAL EXAMPLES OF TESTS POSSIBLE

(PARTIAL LIST)

Water Vapor Transmission Rate Test
95% R.H. at +100°F.
JAN-P-127
MIL-A-6752A
MIL-B-131B
MIL-C-5015B
MIL-E-5272C
(4.4.3 Procedure III)
ASTM D-618 Procedure C

Accelerated Aging Test
80% R.H. at +150°F
Interim Federal Specs.
(PPP-T-0060)

MIL-R-11A
MIL-W-76A
JAN-R-19
NEMA STANDARD LP-1

BLUE M

GENERAL SPECIFICATIONS AND PRICES

BASE: Polished 18-8 stainless, type 304, for excellent resistance to corrosion. Heli-arc welded—welds passivated.

AIR-FLOW PATTERN: Annular, mechanical convection, stainless blower powered by 1/6 H.P., quality motor designed for blower duty. Vibrationless shock mounted.

ADJUSTABLE AIR-FLOW: 0 to 150 CFM. 0 to 30 complete changes of entire work chamber volume per minute.

STAINLESS RING: 2 in. high; seals top and bottom. Adds height for terminal connections or lead-ins.

BIRNBACH HIGH VOLTAGE TERMINALS (4): Silicone treated; for electrical component tests under load.

COOLING COIL: Seamless copper; efficient design.

SHELF (1): Electropolished stainless steel, 18-8, wire type. Adjustable.

HYGROMETER: On Model VP-100AT-1 consists of wet and dry bulb glass thermometers, red fill, -15°C. to +105°C., 1°C. graduations. Wick, water reservoir and R.H. chart supplied.

PILOT LAMPS (4): Indicate unit operations; control action.

SHIELDED CHAMBER: No direct radiation.

WATER STRAINER: Bronze body, monel wire mesh, self-cleaning "Y" type. No disconnecting to "flush".

WET AND DRY BULB CONTROLS: SCR switches greatly reduce current through control switches. Thus, sensitive microswitches are used for close tolerance control. Hydraulic thermal system provides fast response and positive "on-off" action. Calibration adjustment screw, accessible through panel front, provides rapid "zeroing-in" of temperature.

WET BULB RECORDER WICK CONTAINER: Stainless steel supplied on models with recording.

SIMPLE INSTALLATION: (1) connect to power, (2) connect water line to cooling coil, (3) provide suitable drain.

WIRING: All wiring complete and totally enclosed. Meets N.E. Code, as amended. Terminal box provided.

AUTOMATICALLY CONTROLS HUMIDITY
From *20% to 98% (±1%)
(*See Chart for exact conditions possible)
AUTOMATICALLY CONTROLS DRY BULB
From Room to +77°C. (±½°C.)
VP-100AT-1 SERIES

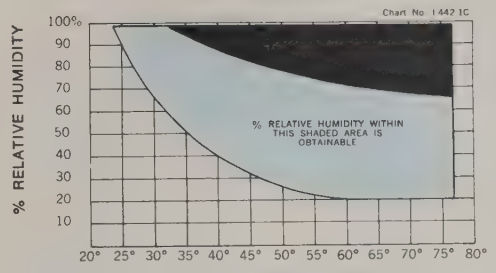


Chart gives Relative Humidity obtainable using +21°C. tap water as cooling medium and ambient temperatures between +21°C. and +27°C. No refrigeration and/or compressor system is necessary to obtain Relative Humidity shown in shaded area. With tap water temperature colder than +21°C., lower percentages of Relative Humidities are obtainable.

NOTE: Area in solid black indicates percentage of Relative Humidity which can be obtained WITHOUT use of tap water cooling

BUILT-IN OVERTEMPERATURE PROTECTION: Provides: (a) protection against excess temperature build-up, (b)protection of work load, (c) immediate indication of failure of any component in control circuit. Includes: (1) Safety Thermostat, (2) Push-Button Reset Switch.

****FOR MODEL VP-100RAT-1 ONLY—RECORDER, 2 PEN, WET AND DRY BULB:** A separate quality instrument with -18°C. to +93°C. range, 24 hour chart drive, 100-12 in. diameter charts, pens and all accessories. Total accuracy: ±1% of scale. Calibrated at +65°C., ±½°C. Not connected electrically or mechanically to control. Monitors and provides records only. Factory installed and calibrated.

Model Number	Inside Working Chamber Inches (Cm.) Dia.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Total KVA	*Voltage 60 Hz. A.C. Single Phase	Shipping Weight Lbs. (Kg.)	Complete Price with Overtemperature Protection
VP-100AT-1	16 (40)	14 (35)	23 (58)	20 (51)	29 (73)	1.8	120 V.	95 (43)	$1275.00
**VP-100RAT-1	(1.6 cu. ft. volume)		29 (73)	20 (51)	60 (152)	1.8	120 V.	235 (107)	2185.00

*Units available for 240 V. and 208 V./1 Ph. We will supply a separate autoformer package complete with line cord and plug. Simple installation Specify Part No. E17E-1-2 ..... $120.00 Each

**Includes 24 hour Wet and Dry Bulb Recorder, factory installed on side of cabinet type floor stand

OPTIONAL AND RECOMMENDED ACCESSORIES — SPARE PARTS

Please give unit model no., and voltage when ordering accessories

EXTRA CHARTS: Per box of 100 ..... $10.50 Each
Specify: Part No. C10A-4-1 (0°C.—24 Hr.);
Part No. C10A-4-3 (0°F.—24 Hr.)

EXTRA WICKS AND PENS: For recorders on Model VP-100RAT-1.
Wicks: Part No. C10F-1 ..... $14.00/Doz.
Pens: Part No. C10D-4-1 ..... $29.50/Set

CABINET TYPE FLOOR STAND: Heavy steel. 18" x 18" x 30" H. with shelf and door. Attractive blue finish.
Cat. No. FS-100 ..... $115.00 Each

EXTRA GLASS JAR: Includes rubber seal, stainless band.
Cat. No. M14-B7 ..... $134.00 Each

EXTRA SHELF: Same as supplied with cabinet. Stainless steel, 18-8, wire type. Electropolished.
Part No. MO4-A303 ..... $24.00 Each

NOTE: Each cabinet includes a RELATIVE HUMIDITY AND TEMPERATURE CONVERSION SLIDE CHART

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly

BLUE M

vapor-temp®

(PATENTED)

Floor Type

CONTROLLED TEMPERATURE AND HUMIDITY CHAMBERS

with mechanical refrigeration, extended wet and dry bulb ranges and built-in overtemperature protection

AUTOMATICALLY CONTROLS
Humidity: 34% to 98% (±1%)
Dry Bulb: +4°C. to +77°C. (±½°C.)
See chart on opposite page for exact conditions.

RECOMMENDED FOR: a.) Temperatures at and below ambient; b.) Lower humidities at ambient; c.) Extremely corrosive tap water conditions, causing excessive water cooled equipment maintenance; d.) Abnormally high tap water temperatures.

Has all the salient basic features of our standard VAPOR-TEMP VP-100AT-1 series.

ACCURACY OF PERFORMANCE
Dry bulb: ±½°C. Wet bulb: ±½°C.

WET AND DRY BULB RECORDER
Monitors and provides records.

EQUIPMENT COVERED BY OUR EXCLUSIVE
PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM
WARRANTY
SEE PAGE 16

COMPLETELY REDESIGNED FOR GREATER RELIABILITY!

SOLID-STATE SCR SWITCHING ON WET AND DRY BULB CIRCUITS!
Eliminates all relays—and relay failure! Minimizes microswitch failure. Chief cause of down-time practically eliminated . . . making these already proven units even more reliable.

PATENTED MEMORY RING® DIAL—FOR EASY, PIN-POINT TEMPERATURE CALIBRATION!
Lets you zero-in on all temperatures, or those you use most, with laboratory exactness—"remembers" every calibration factor for you. You get the exact temperature called for every time. Standard dial graduated in Centigrade. Control panel recessed . . . controls simplified; makes unit easier than ever to use!

Meets most MIL, JAN, ASTM and NEMA Specifications

TYPICAL EXAMPLES OF TESTS POSSIBLE
(PARTIAL LIST)

Water Vapor Transmission Rate Test
95% R.H. at +100°F.
JAN-P-127
MIL-A-6752A
MIL-B-131B
MIL-C-5015B
MIL-E-5272C
(4.4.3 Procedure III)

Accelerated Aging Test
80% R.H. at +150°F
Interim Federal Specs.
(PPP-T-0060)
MIL-R-11A
MIL-W-76A
JAN-R-19
NEMA STANDARD LP-1

ASTM D-618 Procedure C

VAPOR PRESSURE SYSTEM—NO WET BULB CONTROL WICK TO CHANGE
Temperature range and control of relative humidity have been extended by adding to Blue M time-proven VAPOR-TEMP Controlled Temperature and Humidity Chamber, a complete, built-in mechanical refrigeration system—CONSTANT-FLOW design.

Dry Bulb temperature now controllable from +4°C. to +77°C. with maximum tolerance of ±½°C.; per cent relative humidity now controllable from 34% to 98%. AT +21°C., PER CENT RELATIVE HUMIDITY CAN BE CONTROLLED FROM 50% to 92%.

This new series of VAPOR-TEMP Humidity Chambers is completely self-contained—no water necessary as coolant; ready for power hook-up and fully automatic in operation and recording.

Basic chamber and cabinet construction similar to Blue M standard series VP-100AT-1. Units consist of Pyrex jar 16 in. diam. x 12 in. high; one shelf, stainless steel, adjustable; wet and dry bulb recorder; floor stand and mechanical refrigeration system.

VAPOR-TEMP IS IDEAL FOR ELECTRICAL INDUSTRY'S MANUFACTURE OF RELAYS, CONDENSERS, TRANSISTORS, TRANSFORMERS, MOTORS, TIMERS, WIRE AND CABLE, FILTERS, RECTIFIERS, PRINTED CIRCUITS AND RELATED ITEMS. Also suitable for many applications in Biological and Pharmaceutical Fields, Public Health Departments, Dairy Industry, Water and Sewage Test Laboratories, Hospital and Clinical Laboratories, Medical Schools, Agricultural Experiment Stations.

BLUE M

GENERAL SPECIFICATIONS AND PRICES

BASE: Construction of polished 18-8 stainless, type 304, for excellent resistance to corrosion. Heli-arc welded. Welds passivated.

AIR-FLOW PATTERN: Annular Mechanical Convection. Stainless blower powered by 1/6 H.P., quality motor designed for blower duty. Vibrationless shock mounted.

ADJUSTABLE AIR-FLOW: From 0 to 150 CFM. 0 to 30 changes of entire work chamber volume per minute.

CIRCULAR RING: 2 in. high; stainless steel with seals top and bottom. Adds working height; permits additional terminal connections or lead-ins.

BIRNBACH HIGH VOLTAGE TERMINALS (4): Silicone treated; permit electrical component tests under load.

COOLING COIL: Efficient circular design.

SHELF (1): Electropolished stainless, 18-8, wire type. Adjustable.

NEON PILOT LAMPS (4): Indicate unit and control action.

SHIELDED CONDITIONING CHAMBER: Samples not subjected to direct radiation.

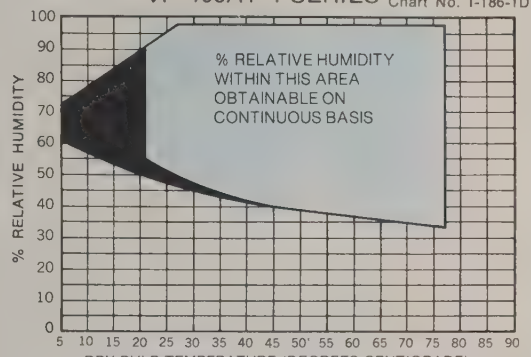
RECORDER, 2 PEN, WET AND DRY BULB: A separate quality instrument with -18°C. to +93°C. range, 24 hour chart drive, 100-12 in. diameter charts, pens and all accessories included. Total accuracy: ±1% of scale range. Calibrated at +65°C. ±½°C. Not connected electrically or mechanically to control system. Monitors and provides records only. Mounted on floor stand, but may be removed for wall mounting.

LOW VOLTAGE CONTROL CIRCUIT: Decided factor in lengthening life of contacts. Results in far more sensitive temperature control response.

REFRIGERATION SYSTEM: Quality hermetically sealed, 1/5 H.P. Uses Refrigerant 12. Smooth, quiet, reliable operation. Housed in heavy steel cabinet. Electronically tested after charging to insure a gas tight system.

WET AND DRY BULB CONTROLS: SCR switches greatly reduce current through control switches. Thus, extremely sensitive microswitches are used for close tolerance control. Liquid filled hydraulic thermal system provides fast response and positive "on-off" action. Calibration adjustment screw, readily accessible through panel front, provides rapid "zeroing-in" of temperature.

AUTOMATICALLY CONTROLS HUMIDITY
From *34% to 98% (±1%)
(*See chart for exact conditions possible)
AUTOMATICALLY CONTROLS DRY BULB
From +4°C. to +77°C. (±½°C.)
VP-400AT-1 SERIES Chart No. I-186-1D



Graph gives relative humidity obtainable with Blue M VAPOR-TEMP® Controlled Chamber with Mechanical Refrigeration.

NOTE: Area in solid black indicates percentage of relative humidity that CANNOT be accurately controlled for long periods due to icing of water reservoirs. However, dry bulb temperature can be accurately controlled down to 5°C.

CABINET TYPE FLOOR STAND: Heavy steel construction, 18" x 18" x 30" H. Houses compressor, recorder, related accessories. Finished in attractive blue enamel.

WIRING: All wiring complete and totally enclosed. Meets N.E. Code, as amended. Terminal box provided.

BUILT-IN OVERTEMPERATURE PROTECTION: Provides; (a) protection against excess temperature build-up, (b) protection of workload, (c) immediate indication of failure of any component part in control circuit. Includes: (1) Safety Thermostat, (2) Push-Button Reset Switch.

Model Number	Inside Working Chamber Inches (Cm.) Dia.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Total KVA	*Voltage 60 Hz. A.C. Single Phase	Compressor Size	Shipping Weight Lbs. (Kg.)	Complete Price with Overtemperature Protection
VP-400AT-1	16 (40) (1.6 cu. ft. volume)	14 (35)	23 (58)	26 (65)	60 (152)	2.2	120 V	1/5 HP	315 (143)	$3720.00

*Unit available for 240 V. and 208 V /1 Ph We will supply a separate autoformer package complete with line cord and plug Simple installation

Specify Part No E17E-1-2 ..... $120.00 Each

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories

EXTRA SHELF: Same as supplied with cabinet. Stainless steel, 18-8, wire type. Electropolished.
Part No. MO4-A303 ..... $24.00 Each

EXTRA CHARTS: Per box of 100 ..... $10.50 Each
Specify: Part No. C10A-4-1: 0°C.—24 Hour
Part No. C10A-4-3: 0°F.—24 Hour

EXTRA WICKS AND PENS: For recorder
Wicks: Part No. C10F-1 ..... $14.00/Doz.
Pens: Part No. C10D-4-1 ..... $29.50/Set

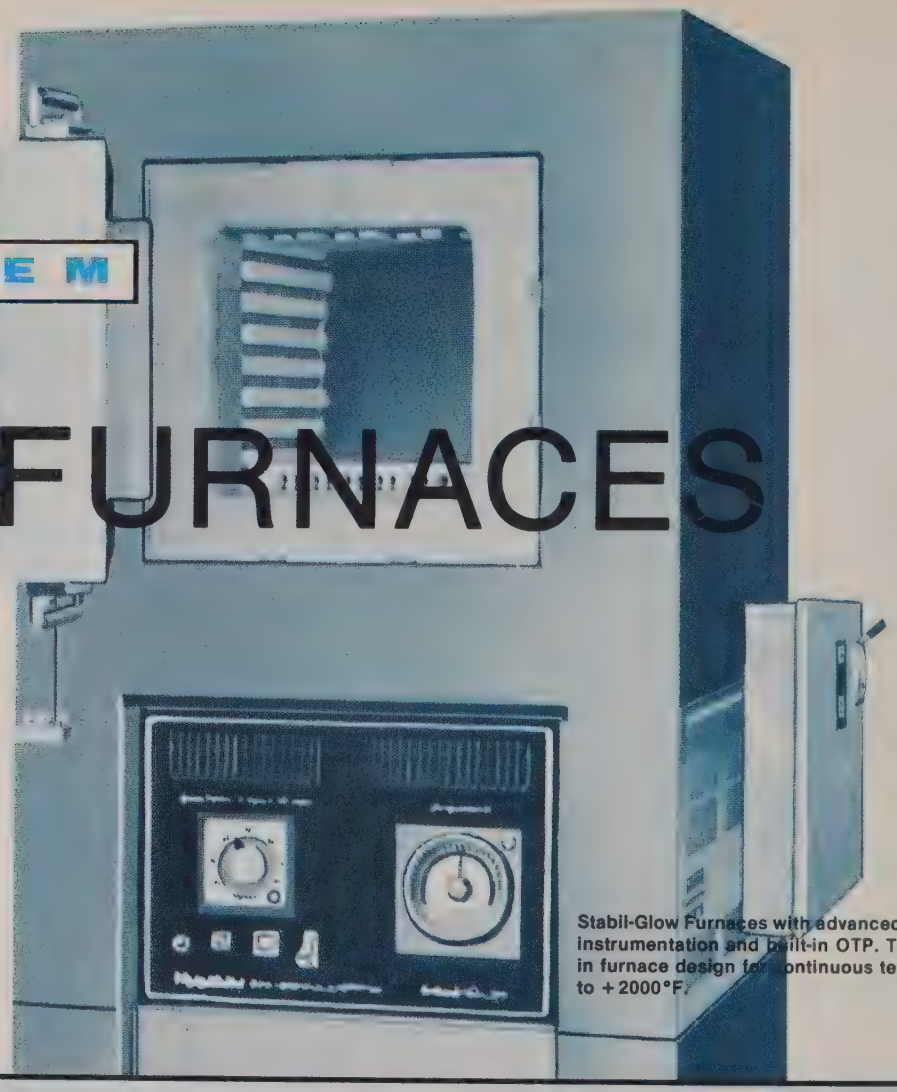
EXTRA GLASS JAR: Includes rubber seal, stainless band.
Cat No. M14-B7 ..... $134.00 Each

NOTE: Each cabinet includes a RELATIVE HUMIDITY and TEMPERATURE CONVERSION SLIDE CHART

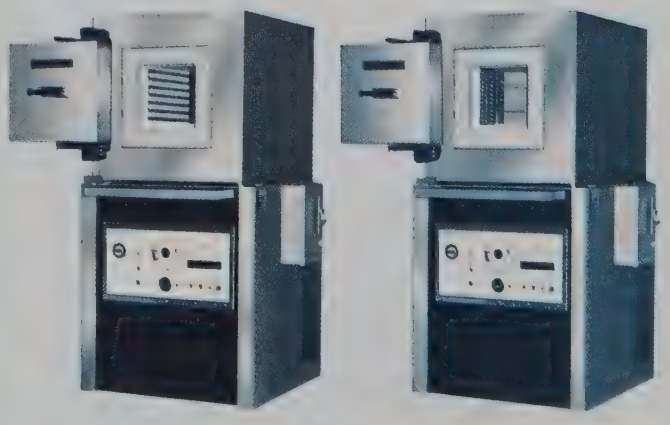
Shipping weights shown are for standard models Units ordered with accessories may require special packing increasing shipping weight slightly

BLUE M

FURNACES



Stabil-Glow Furnaces with advanced solid-state instrumentation and built-in OTP. The ultimate in furnace design for continuous temperatures to +2000°F.



Unexcelled POWER-O-MATIC 80 controlled furnaces: Stabil-Glow Box Type Furnace, left, designed for critical continuous service at +2000°F. See pages 150-151. Rad-O-Glow Globar® Furnace, right, has continuous operating range to +2800°F. See pages 152-153.

Lab-size Rad-O-Glow High Temperature Globar Furnace, left, for continuous operation to +2700°F. and floor model, right, for continuous operation to +2750°F. both feature advanced solid-state instrumentation and built-in OTP. They are described on pages 154-157.

BLUE M

THE MOST DEPENDABLE AND VERSATILE FURNACE LINE IN AMERICA . . . NOW IMPROVED TO FIT YOUR HIGH TEMPERATURE NEEDS EVEN BETTER!

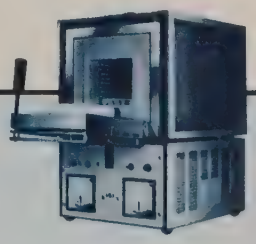
Mention a furnace in countless installations across the country, and the people who know automatically mention Blue M. For years, Blue M Furnaces have been the yardstick for dependability, reliability and economy. Now Blue M has strengthened an already dominant position in the field by reengineering and improving the line so that it blankets the great majority of needs and applications in the scientific and laboratory field.

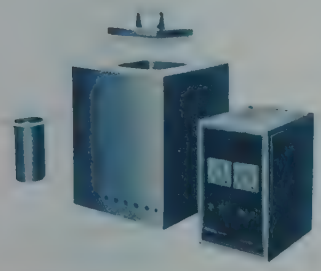
Of prime importance . . . Blue M has made solid-state over-temperature protection standard on all models except those designed for non-critical service. Advanced solid-state instrumentation, too, has been engineered into all but these economical units to assure accurate, reliable high temperature performance. For those requiring the ultimate in a fine furnace, Blue M has developed the superb units featuring the patented POWER-O-MATIC 80® Solid-State SCR Proportioning Control for straight-line performance at temperatures to +2950°F. And our completely redesigned Lab-Heat Muffle Furnaces—long the standard laboratory furnace in innumerable installations are now better than ever before!

We invite you to see for yourself the many exciting advantages of these units and of the others shown here. Pick out the ones that fit your requirements (no doubt one of them will!) and read about them in detail. You'll understand why people who specify furnaces in the first place come to Blue M first!

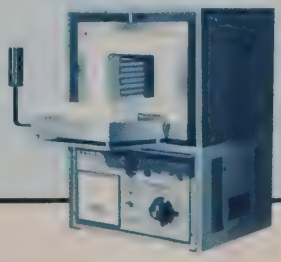
We call your special attention to the pages immediately following these which offer a succinct description of heat treating and pertinent terminology used in the industry. We hope you will find this useful to you and your associates.

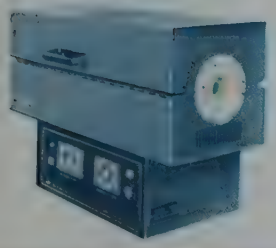
NOTE: Many models meet ASTM Specifications. A list of the typical specs is shown on pages 182-183.





If you're in the market for a truly modern, efficient laboratory furnace, don't miss reading the details of the all-new look and safety offered by our Lab-Heat Box Type Muffle Furnaces on pages 146-149. Pictured above is a representative model of our E-514A-3 Series with solid-state instrumentation and built-in OTP. They operate continuously to +1850°F. For less critical service is the economical M10A-2A Series, below, with new VARI-WATT Power Level Control. These units operate continuously to +1832°F.





Special furnaces to perform special jobs are exemplified by these exclusive Blue M designs. Left, top, Stabil-Glow Crucible or Pot Furnace, and, below, Tube Furnaces for continuous service to +1850°F. Both feature advanced instrumentation and OTP. They are described on pages 158-161. Above, Lab-Heat Dental Muffle Furnace with a range from +212°F. to +1600°F. See pages 162-163.

TERMS AND DEFINITIONS USED IN HEAT TREATING

AIR HARDENING
A hardening process wherein the steel is heated to the hardening temperature and cooled in air. (Be sure steel is air-hardening type.)

ANNEALING
Heating and slowing cooling to remove stresses, make steel softer, refine the structure, or change its ductility.

BRINELL HARDNESS
This test consists of forcing a ball of standard diameter into the specimen being tested, under standard pressure, and judging the hardness of the material by the amount of material displaced.

CARBURIZING
Adding carbon to iron base alloys by absorption through heating the metal at a temperature below its melting point in contact with carbonaceous material.

CASE HARDENING
Carburizing and subsequent hardening by heat treatment.

DECARBURIZATION
Removal of carbon. The term usually refers to the removal of carbon from the surface of steel in the presence of heat.

DRAWING
(Tempering) Re-heating, after hardening, to a temperature below the critical for the purpose of reducing the hardness of the steel and increasing its toughness.

HEAT TREATMENT
Method of heating and cooling of finished metals or alloys to produce certain desirable properties, such as hardness, softness, ductility, grain refinement, etc.

HARDENING
(As applied to heat treatment of steel.) Heating and quenching to produce increased hardness.

OIL QUENCH
A quench from the hardening temperature in which oil is the cooling medium.

QUENCHING
The process of cooling rapidly by immersion in oil, water, etc.

QUENCHING TEMPERATURE
The temperature from which steel is quenched during a heat treating process.

QUENCHING MEDIUM
The medium used for cooling steel during heat treatment, usually oil, water, air, or molten salt.

ROCKWELL HARDNESS TEST
This test consists of forcing a cone-shaped diamond or hardened steel ball into the specimen being tested under standard pressure. The depth of penetration is an indication of the Rockwell hardness.

SOAKING
Holding steel at a predetermined temperature for a sufficient time to assure uniform heat penetration and/or to complete the solution of carbides.

TEMPERING
Heating after hardening to a temperature below the critical and then cooling.

WATER QUENCH
(In steel heat treatment.) Cooling steel from its quenching temperature by immersion in water. (A brine solution is a more rapid quench, will produce a harder surface and eliminate possibility of soft spots.)

The following is a simple explanation of heat treatment:

1. Steel undergoes definite internal changes when subjected to a temperature above its critical range.
2. After reaching this temperature, if the steel is allowed to cool naturally, it will return to a normal condition.
3. For steel to return to its normal condition after being heated above its critical range, sufficient time must elapse during the cooling so that the internal changes which took place during heating will have time to reverse themselves.
4. If the heated steel is cooled more rapidly than the internal changes can reverse themselves, then there will be fixed in the steel certain modification of the structure which will alter the physical characteristics of the steel, tensile strength, hardness, toughness, etc.

DRAWING OR TEMPERING

When the steel is fully hardened, it is a highly stressed condition and is too hard and brittle for applications. It is, therefore, necessary to relieve this stressed condition, increase the toughness and ductility, and still retain sufficient hardness and strength. This change can only be made by the application of heat and this process is known as drawing or tempering. This consists of reheating the quenched steel sufficiently to transform the hard martensite into other softer carbides. Different degrees of hardness can be developed in the steel by utilizing different drawing temperature. The higher the drawing temperature, the softer the steel becomes. An oven with automatic temperature control is recommended for precision work. Be sure to bring the furnace and tool up to temperature together. Do not put cold tool in a hot oven/furnace.

It is very important that this operation be done just as soon as possible after the quench in order to promptly relieve the quenching stresses. In cooling steel after the draw, no change in hardness or ductility will take place whether the steel is cooled rapidly or slowly; however, it is advisable to allow the tool to cool normally in the air rather than quench it because a sudden quench might set up shrinking stresses.

Time is an important element in drawing. More complete stress relief is secured by a longer soak at the drawing temperature. Without increasing the draw temperature, greater toughness is also obtained with a long draw rather than a short one.

Double tempering is a wise precaution. It is a corrective treatment recommended. It can do no harm and may do a lot of good. All steels have a recommended draw temperature for a definite hardness; however, time is a very important factor. The time generally given by the tool steel manufacturer means time at temperature; therefore, in order to get the correct total time in the oven, it is necessary to add the time required for the tool to reach oven temperature; this time element is shown on Chart No. 1.

Unsatisfactory hardening of a tool is most likely caused by:

1. Failure to remove (machine off) sufficient surface of hot rolled bar before hardening.
2. Failure to heat to a high enough temperature.
3. Failure to quench fast enough.
4. Overheated (too high above critical range.)
5. Decarburized surface.
6. Contaminated water or oil.
7. Use of wrong steel.
8. Re-worked tools must be thoroughly annealed before hardening.

HARDENING OF STEEL

The first step in this process is to heat the steel to the correct temperature for quenching. All tool steels have a critical range, and it is necessary to heat the steel above this critical temperature range in order to be able to fix, by quenching, the changes desired. (All companies making tool steel furnished the correct quenching temperature for their steels.) Care must be exercised in the rate of heating. When the steel is placed in a furnace, the temperature of the surface of the steel is first raised and the heat then travels through the steel by conduction toward the center. This progresses until the entire mass has reached the same temperature as the furnace itself. When the steel is first heated, it expands and if a cold piece of steel is placed in a hot furnace, the surface expands more rapidly than the core. The surface will then have a tendency to pull away form the center thus inducing internal stress. In soft steels, this condition is not too important as the steel is sufficiently ductile to accommodate itself to this expansion; however, the harder tool steels are much more susceptible to injury due to rapid heating, and, therefore, should be preheated before being placed in a hot furnace. Pre-heating is not actually necessary for small tools if the quenching temperature is below 1600 degrees F., however, if a tool has large or heavy and light sections which are adjacent, it should be pre-heated to avoid excessive temperature gradients that could cause warping or cracking during heating. The average tool steel can be heated at the rate of five minutes per ⅛" of thickness.

After the steel is up to temperature, it should be allowed to soak for at least five minutes per inch of diameter or thickness after which it is ready to be quenched. The furnace temperature should never be hotter than the quenching temperature. In other words, if the quenching temperature is 1500 degrees the furnace should be held at that temperature and the steel allowed to reach this temperature. A furnace with automatic temperature control is recommended for precision work.

QUENCHING

More steel is ruined in this process than any other phase of heat treating. The purpose of quenching steel is to fix in it some of the changes which have been caused by heating the steel above the critical range. Quenching at the correct temperature results in an increase in hardness and tensile strength.

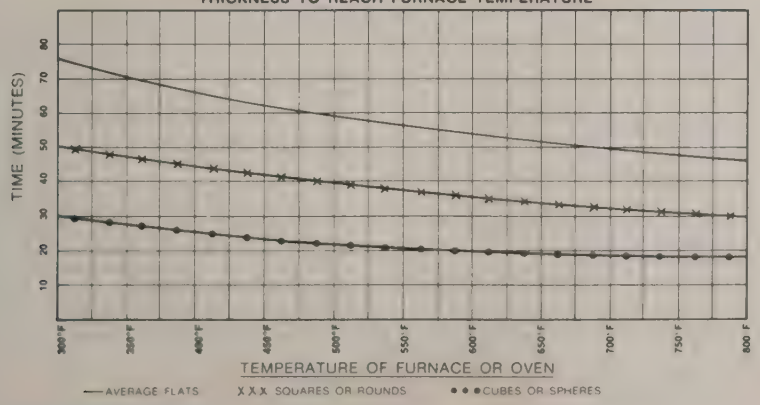
All tool steels are made for a definite quenching medium for best results and the tool steel company will specify which medium is to be used—air, oil, or water. When using liquid baths, sufficient quenching fluid must be used so that the liquid will not get too hot for effective quenching. Quenching should not be continued beyond the point necessary to produce the required hardness penetration. In other words, the sooner a part can be removed from the quenching bath and the drawing or tempering operation performed, the less will be the danger of quenching cracks. Generally speaking, the tool should be removed from the quench when it is approximately 150 degrees Fahrenheit and then be allowed to cool to room temperature after which it should be immediately placed in the tempering oven.

Approximately one gallon of oil or water should be provided for every pound of steel quenched per hour. If the bath is in constant use, it will be necessary to provide some means of removing the heat by circulating the quenching medium through cooling coils.

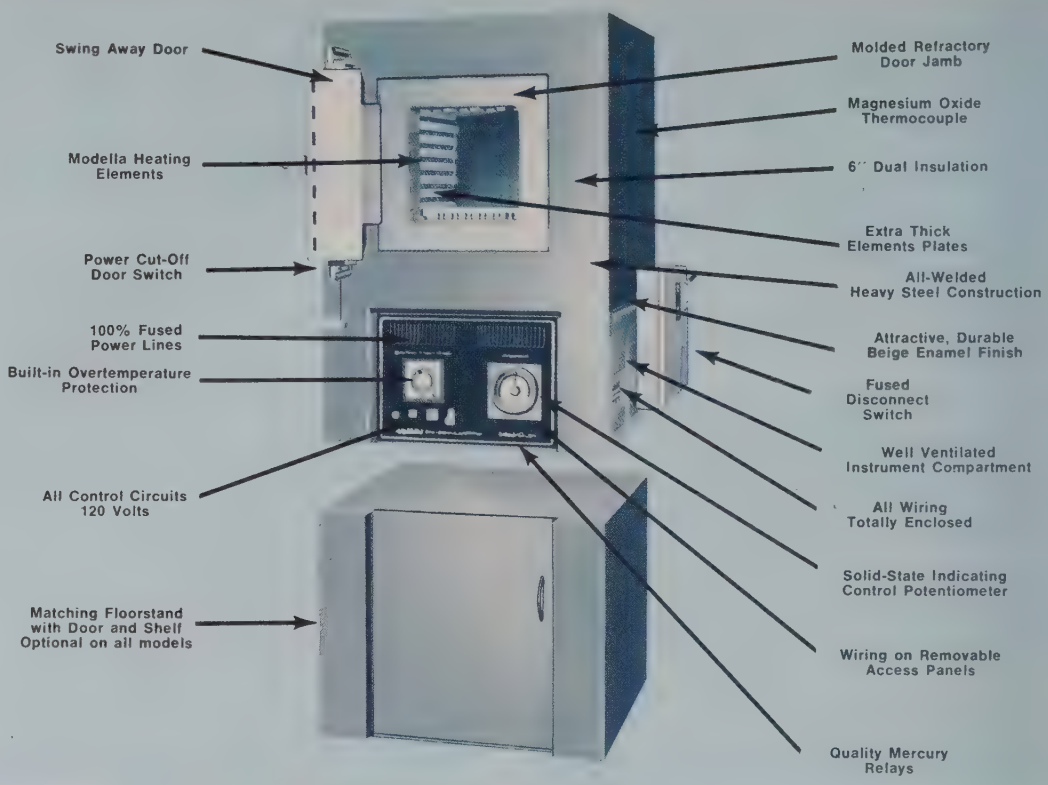
Rapid liquid quenching will produce greater difference in hardness between the surface and the center of any large section. Consequently, in large sections, more quenching stresses will be developed. In general, it is not good practice to use a drastic quench to secure surface hardness on large sections. The shape of the part being quenched has a definite relation to the type of quenching medium best suited for the job. When the part consists of thick and thin sections, a drastic quench will harden the thin section before the thick part has had a chance to cool. This premature cooling of one section will produce uneven contraction and stresses which frequently results in cracking. Surface finish is a factor not to be overlooked in quenching. A smooth surface will cool more rapidly in quenching than a surface which is rough machined. This is due to the fact that steam or gas bubbles will adhere more tightly to a rough surface, thus preventing the normal removal of heat during the quench. It is important to circulate the quenching medium rapidly or agitate the parts being quenched so as to prevent this adherence of gas or steam bubbles to the surface of the steel if the maximum quenching effect is to be obtained.

DRAWING OR TEMPERING CHART (STRESS RELIEF)

APPROXIMATE HEATING TIME PER INCH (STEEL) OF DIAMETER OR THICKNESS TO REACH FURNACE TEMPERATURE



BLUE M Electric Company CORPORATE HEADQUARTERS: BLUE ISLAND, ILLINOIS 60406


Swing Away Door
Modella Heating Elements
Power Cut-Off Door Switch
100% Fused Power Lines
Built-in Overtemperature Protection
All Control Circuits 120 Volts
Matching Floorstand with Door and Shelf Optional on all models
Molded Refractory Door Jamb
Magnesium Oxide Thermocouple
6" Dual Insulation
Extra Thick Elements Plates
All-Welded Heavy Steel Construction
Attractive, Durable Beige Enamel Finish
Fused Disconnect Switch
Well Ventilated Instrument Compartment
All Wiring Totally Enclosed
Solid-State Indicating Control Potentiometer
Wiring on Removable Access Panels
Quality Mercury Relays

QUALITY FEATURES AND PERFORMANCE YOU CAN

IMPROVED INSTRUMENTATION

MAIN CONTROLLER: Solid-state indicating temperature control of potentiometric design featuring advanced integrated circuitry and time proportioning. Shock and vibration resistant. Illuminated direct read-out dial with 8" scale provides setting accuracy to within 0.5% of scale. Indication is 50% of span on either side of setpoint. Example: if temperature is set at +1000°C. on a controller with a +1300°C. span, indicator registers actual chamber temperature at any point between +350°C. and maximum. Indication accuracy is ±1% of full scale. Dual scale in °C. and °F.

BUILT-IN OVERTEMPERATURE PROTECTION: Similar solid-state instrument complements main control and conveniently installed adjacent to it. Features exclusive Blue M MAX-SET™ time-delay circuitry and operation as described on page 14. Easily set. Positive protection at all times . . . standard on all units. Centigrade scale is standard; Fahrenheit available when specified at time of order.

MAGNESIUM OXIDE THERMOCOUPLE: Inconel sheathed for longer life. Not exposed directly to heat. Oxidation is minimized. Thermocouple break protection.

MERCURY RELAY: Silent and fast operating. No exposed arc, dust and moisture-proof at all times. Hermetically sealed, mercury to mercury, make and break in a hydrogen atmosphere.

CONSTRUCTION: Heavy gauge steel and structural members. Welded and reinforced throughout. Instrument compartment well ventilated to reduce heat build-up around control and wiring within safe specified range.

EXTERIOR FINISH: Handsome, distinctive hammerloid beige baked-on enamel. Complements any laboratory or production department.

6" DUAL INSULATION: High temperature firebrick, 4½ in. thick, plus 1½ in. of Therm-O-Block on all six sides. Minimizes heat loss.

MODELLA HEATING ELEMENTS: Low watt density design —helically coiled—means long life. Are non-flaking and practically impervious to attack from sulphur and its compounds. Wire withstands +2400°F. Elements on all four sides, but reversed on bottom to form smooth base for placement of material to be treated. Easily and individually replaced, if ever necessary.

SWING-AWAY DOOR: Double wall design, ventilated to keep cool during furnace operation. Firebrick plug fits into furnace throat and seals furnace interior. Door opens wide to permit full access to interior and is held firmly closed by special spring assembly. Door bracket and supports black enamel finish. Phenolic handle

SAFETY SHUTOFF: Automatically breaks circuit to shut off elements when door is opened. Fused disconnect switch

MOLDED REFRACTORY DOOR JAMB: Superior to ordinary firebrick customarily used. Long lasting, clean

ELEMENT PLATES: Ribbed, extra thick . . . crack-resistant. Grooved to support elements along entire length. Made of high heat electrical refractory fired at +2750°F

BLUE M

BLUE M

Stabil-Glow®

BOX TYPE FURNACES

**NOW WITH NEW INSTRUMENTATION . . .
BUILT-IN OVERTEMPERATURE PROTECTION —
ALL SOLID-STATE!**

**CONTINUOUS OPERATING RANGE TO +1093°C. (+2000°F.)
CAN BE OPERATED INTERMITTENTLY TO +1204°C. (+2200°F.)**

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY BLUE M

SEE PAGE 16

The addition of built-in overtemperature protection to complement new solid-state indicating control instrumentation provides a new dimension of safety to these advanced units. Now more than ever before these Stabil-Glow Box Type Furnaces offer the industrial and laboratory specialist design, appearance and performance characteristics which have absolutely no peer. These units can be relied upon implicitly for innumerable high temperature applications of a critical nature.

Besides the new control and overtemperature protection, these furnaces have such other outstanding features as a swing-away door with safety cut-off for maximum operator convenience and safety; fused disconnect switch; heavy-duty, all-welded steel construction with dual insulation; Modella heating elements for long life dependability at elevated temperatures and fast run-up; fused power lines; all wiring on removable access panels. Use of mercury relays assures quiet operation, free of noisy contactor clapping.

It should be noted that these are bench model furnaces. However, all of them are available with sturdy, attractive companion floor stands which convert them into floor models. These floor stands have been especially designed and built for these furnaces, matching them perfectly in color and configuration, to provide storage and give the appearance of an integral unit.

Added together, these and many other design features result in a furnace you can depend on to give trouble-free, economical service. All in a smartly styled cabinet that becomes a handsome—as well as reliable—addition to any laboratory or production department.

For all-new Stabil-Glow Furnaces with Blue M's patented POWER-O-MATIC 80® Solid-state Proportioning Control, see pages 150/151.

EXPECT ONLY IN A QUALITY FURNACE

REMOVABLE LOAD TRAYS: Molded of high-heat electrical refractory. Number supplied varies with furnace: Series 8600, 8625 and 8640 receive two; Series 2010, 8615, 8630 and 8650 receive three; Series 2015 and 8655 receive four.

WIRING: All wiring totally enclosed. Meets amended N.E. Code. Wiring installed on removable access panels at front and rear of furnace; can be inspected quickly and easily. All control circuits are wired for 120 volts and all power lines are fused for maximum safety and protection through main fused disconnect switch located on right side of furnace. Furnace is ready for power hook-up.

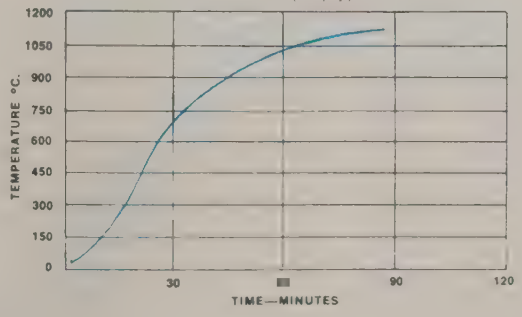
ENGINEERED TO FIT YOUR NEEDS . . . BY VOLTAGE, SIZE AND PERFORMANCE!

Blue M's Stabil-Glow Box Type Furnaces—besides providing the many superior design and construction features detailed here—are available with a variety of standard voltages to fit just about any plant requirement. As a glance at the specification chart on the next page will show, you can probably pick out the exact model that fits your electrical requirements without a thought about bothersome and costly modifications.

Sizes, too, have been carefully engineered to fit most common needs. There are nine in all. One will undoubtedly match your job—whether you need a small size for laboratory work or a larger model for volume processing.

Finally, K.W. ratings have been boosted to insure peak performance. The chart graphically shows the performance of a typical model—performance you won't find elsewhere without paying a premium. All models reach maximum temperature of +2000°F. from start in 60-90 minutes. And K.W. ratings are such that all 240-volt units will operate efficiently on 208-volt power. There are also a number of accessories available to help you achieve maximum operational efficiency from these furnaces. They are described in full on the following pages.

Typical heat-up curve for standard Blue M Stabil-Glow Furnace (empty)



Model Number	Inside Dimensions Inches (Cm.)			Overall Dimensions Inches (Cm.)			Total KVA	Voltage 60 Hz. A.C.
	W.	D.	H.	W.	D.	H.**		
2010C-3	5¼ (13)	12½ (32)	5 (12)	21 (53)	33 (84)	52 (132)	4.0	*240 V./1 Ph.
2015C-3	5¼ (13)	18¾ (47)	5 (12)	21 (53)	39 (98)	52 (132)	5.0	*240 V./1 Ph.
2015D-3								480 V./1 Ph.
2015F-3								*240 V./3 Ph.
8600C-3	8½ (21)	12 (31)	6 (15)	25 (63)	32 (80)	54 (136)	7.0	*240 V./1 Ph.
8600D-3								480 V./1 Ph.
8600F-3								*240 V./3 Ph.
8615C-3	8½ (21)	18 (45)	6 (15)	25 (63)	38 (95)	54 (136)	9.0	*240 V./1 Ph.
8615D-3								480 V./1 Ph.
8615F-3								*240 V./3 Ph.
8625C-3	8½ (21)	12 (31)	8 (20)	25 (63)	32 (80)	56 (142)	8.0	*240 V./1 Ph.
8625D-3								480 V./1 Ph.
8625F-3								*240 V./3 Ph.
8630C-3	8½ (21)	18 (45)	8 (20)	25 (63)	38 (95)	56 (142)	11.5	*240 V./1 Ph.
8630D-3								480 V./1 Ph.
8630F-3								*240 V./3 Ph.
8640C-3	10 (25)	12 (31)	10 (25)	26 (65)	32 (80)	58 (147)	11.5	*240 V./1 Ph.
8640D-3								480 V./1 Ph.
8640F-3								*240 V./3 Ph.
8650C-3	10 (25)	18 (45)	10 (25)	26 (65)	38 (95)	58 (147)	14.0	*240 V./1 Ph.
8650D-3								480 V./1 Ph.
8650F-3								*240 V./3 Ph.
8655F-3	10 (25)	24 (61)	10 (25)	26 (65)	44 (110)	58 (147)	18.0	*240 V./3 Ph.
8655G-3								480 V./3 Ph.

*Units will operate reliably when connected to 208 volt service with minor wiring change. A 25% reduction in element power will result.

OTHER OPTIONAL ACCESSORIES — SPARE PARTS

EXTRA THERMOCOUPLE: Part No. C11B-3-7 . . . . . **$30.00** Ea.

EXTRA HEATING ELEMENTS: Are available in complete sets of 4: top, bottom, and sides. Prices upon request. Cat. No. shown below is for complete set of 4.

EXTRA ELEMENTS — SET OF 4		
Series Number	Catalog Number	Voltage
2010	FH4-8	240 V./1 Ph.
2015	FH5-4	240 V./1 & 3 Ph., 480 V./1 Ph.
8600	FH7-3	240 V./1 & 3 Ph., 480 V./1 Ph.
8615	FH9-5	240 V./1 & 3 Ph., 480 V./1 Ph.
8625	FH8-16	240 V./1 & 3 Ph., 480 V./1 Ph.
8630	FH12-20	240 V./1 & 3 Ph., 480 V./1 Ph.
8640	FH12-24	240 V./1 & 3 Ph., 480 V./1 Ph.
8650	FH14-9	240 V./1 & 3 Ph., 480 V./1 Ph.
8655F	FH18-7	240 V./3Ph.
8655G	FH18-6	480V./3Ph.

INCONEL LEAD-IN PORT: Centered through back wall, ¾ in. I.D. and threaded on outside end. For introduction of inert gases to furnace interior. NOTE: Furnaces are not completely vapor-tight.

Cat. No. POR-102—(All models) . . . . . **$32.00** Installed

EXTRA LOAD TRAYS			
Series Number	Catalog Number	Number Per Set	Price Per Set
2010	LT-116	3	$16.00
2015	LT-114	4	21.00
8600	LT-102	2	27.00
8615	LT-103	3	40.00
8625	LT-102	2	27.00
8630	LT-103	3	40.00
8640	LT-104	2	27.00
8650	LT-105	3	40.00
8655	LT-115	4	54.00

BLUE M

Shipping Weight Lbs. (Kg.)	Complete Price With OTP
430 (195)	$1040.00
460 (209)	1175.00
	1175.00
	1175.00
580 (263)	1560.00
	1560.00
	1550.00
620 (281)	1795.00
	1795.00
	1745.00
620 (281)	1795.00
	1795.00
	1745.00
650 (295)	1880.00
	1880.00
	1820.00
650 (295)	1880.00
	1880.00
	1820.00
800 (363)	1970.00
	1970.00
	1930.00
850 (386)	2100.00
	2225.00

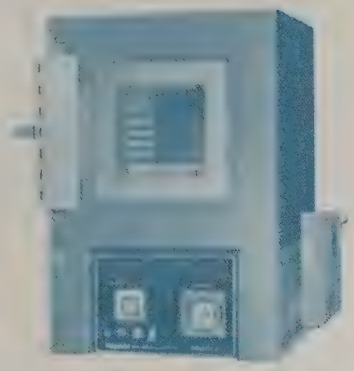
**With optional floorstand, approximately 20" high.

OPTIONAL ACCESSORIES

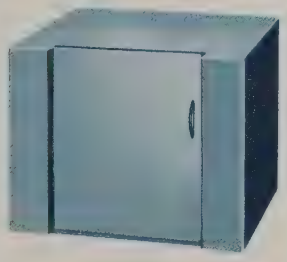
TO HELP YOU GET THE MOST OUT OF YOUR *Stabil-Glow*® FURNACES

CABINET TYPE FLOOR STANDS

QUICKLY CONVERT STANDARD BENCH MODELS INTO FLOOR MODELS



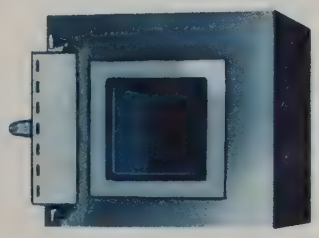
These sturdy, attractive floor stands—available for all models—have been especially designed for these furnaces. They bring work chamber up to convenient working height. Rugged, all-welded steel construction finished in same distinctive beige enamel as furnace to give the appearance of an integral unit. Includes handy storage shelf. All floor stands approximately 20" high.

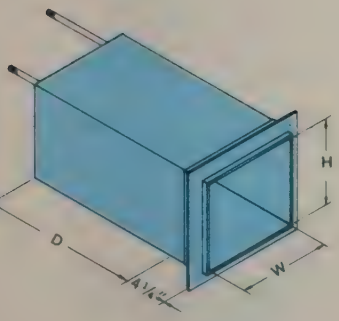


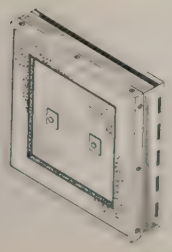
FLOOR STANDS			
Series Number	Catalog Number	Approximate Shipping Weight (Lbs.)	Price Each
2010	FS-156	65	$ 90.00
2015	FS-162	75	105.00
8600	FS-157	85	120.00
8615	FS-158	95	135.00
8625	FS-157	85	120.00
8630	FS-158	95	135.00
8640	FS-159	85	131.00
8650	FS-160	100	145.00
8655	FS-161	110	165.00

INCONEL MUFFLES

The addition of these quality-built Inconel Muffles is an efficient, economical means to protect heating elements and workload from dirt and contaminants during processing. This is particularly important when working to critical standards. Muffles are constructed of No. 11 gauge material, welded with ⅛" Inconel gas inlet pipes and ⅛" Inconel pipe for thermocouple entry. Work area begins 4½" back into muffle proper as shown in sketch. Inner face of door has refractory lining as indicated in right-hand sketch below. At right is a typical furnace with muffle in place. PLEASE NOTE: MUFFLES DO NOT PERMIT FURNACES TO BE USED FOR INERT GAS PROCESSING. THEY DO NOT PREVENT OXIDATION. *Use of muffle limits furnace operating range to +1850°F.*







INCONEL MUFFLES AND REFRACTORY DOOR INNER FACE					
Series Number	Catalog Number	I.D. (Inches) W.	D.	H.	Price Each
2010	NMFL-116	4	11½	4	$285.00
2015	NMFL-117	4	17¾	4	365.00
8600	NMFL-118	7¼	11	5	415.00
8615	NMFL-119	7¼	17	5	540.00
8625	NMFL-120	7¼	11	7	460.00
8630	NMFL-121	7¼	17	7	600.00
8640	NMFL-122	8¾	11	9	635.00
8650	NMFL-123	8¾	17	9	910.00
8655	NMFL-124	8¾	23	9	1090.00

BLUE M

Lab-Heat

Box Type

MUFFLE FURNACE

with solid-state instrumentation and MAX-SET™ overtemperature protection

ADVANCED DESIGN
Safer, more compact, attractive.

SOLID-STATE CONTROL POTENTIOMETER
Indicating type, provides good control throughout extended range.

BUILT-IN MAX-SET OVERTEMPERATURE PROTECTION
Solid-state, complements main control for safety of workloads and equipment.

CONTINUOUS OPERATION:
+66°C. to +1010°C. (+150°F. to +1850°F.)

INTERMITTENT OPERATION:
+66°C. to +1093°C. (+150°F. to +2000°F.)

MODELLA ELEMENTS—ALL FOUR SIDES
Non-oxidizing, impervious to attack from sulphur and its compounds. Provides steady, balanced run-up.

FIREBRICK INSULATION
2½ in. blocks on all six sides.

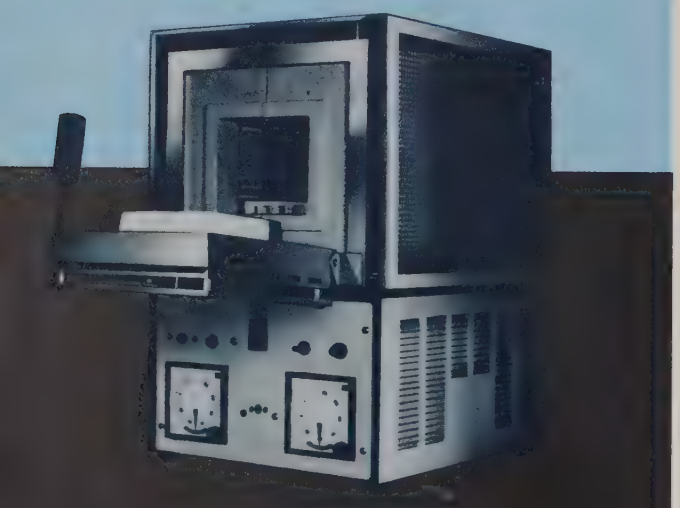
STAINLESS STEEL CABINET AND DOOR ENCASEMENT
Corrosion-resistant and durable.

SPECIAL SAFETY SHIELDS
Surrounds cabinet and door front.

DOOR SWITCH
Automatically shuts down furnace when door is opened.

COUNTERWEIGHTED DOOR
Has safety shield.

ALL WIRING COMPLETE
Ready to operate with terminal box.



PROGRESSIVE DESIGN PROVIDES SAFER, MORE EFFICIENT OPERATION—IN LESS SPACE . . . WITH MODERN APPEARANCE . . . ALL AT MODEST COST!

Blue M took one of our most popular series of furnaces and completely re-engineered them into the modern, advanced chambers presented here. Retained are complementary solid-state control and overtemperature protection instruments for good performance as well as many long-standing, proven construction features. Added are a number of outstanding innovations which put these superior furnaces head and shoulders above competitive laboratory equipment.

Safety has received major emphasis. Besides the built-in overtemperature protection, these furnaces now feature a perforated steel protective shield around the work cabinet and on the face of the door. This dramatically lowers the temperature of the surfaces to which the operator is exposed—even when operating at the upper limits of the unit's range. A door switch insures additional safety by automatically shutting down the unit when the door is opened. A protective shield extending horizontally out from the face of the unit helps safeguard instrumentation against accidental spillage.

Operational efficiency has been improved by modifying heating element design. This provides steady, balanced run-up to set temperature and longer element life.

These various improvements and the many other construction details described on the opposite page have been incorporated into an entirely new physical configuration—compact and modern. Not only do these new models require much less work space, but their handsome appearance will enhance any laboratory.

These fine furnaces—complete and ready to operate—are recommended for such typical laboratory work as precipitate ignition, ash determinations, fusions, incinerations and heat-treating glass or ferrous and non-ferrous metals. Similar units for work requiring less critical performance are described on the following pages.

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY

SEE PAGE 16

BLUE M

GENERAL SPECIFICATIONS AND PRICES

IMPROVED INSTRUMENTATION

MAIN CONTROLLER: Solid-state indicating temperature control of potentiometric design featuring advanced integrated circuitry and time proportioning. Shock and vibration resistant. Illuminated direct read-out dial with 6" scale provides setting accuracy to within 0.5% of scale. Indication is 10% of span on either side of setpoint. Example: if temperature is set at +300°C. on a controller with a 600°C. span, indicator registers actual chamber temperature at any point between +240°C. and +360°C. Indication accuracy is ±1½% of full scale. Scales in Centigrade standard; Fahrenheit available when specified at time of order.

BUILT-IN OVERTEMPERATURE PROTECTION: Similar solid-state instrument complements main control and conveniently installed adjacent to it. Features exclusive Blue M MAX-SET™ time-delay circuitry and operation as described on page 14. Easily set. Positive protection at all times . . . standard on all units.

CONSTRUCTION: Cabinet and door encasement Type 304, 18-8 stainless for maximum corrosion resistance. Special perforated steel panels, finished in attractive blue baked-on enamel, surround cabinet and face of door. Surface temperatures are minimized. Specially designed louvers in matching blue enameled steel base provide exclusive Cross-Flo Ventilation for near ambient safety of all control components.

INSULATION: Extra heavy, 2½ in. thick blocks of high temperature firebrick on all six sides including door.

MERCURY RELAY: Silent and fast. No exposed arc, dust and moisture-proof. Hermetically sealed, mercury to mercury, make/break in hydrogen atmosphere. Double pole.

SAFETY DOOR SWITCH: Automatically shuts down furnace when door is opened.

MODELLA HEATING ELEMENTS: Non-oxidizing, non-flaking, practically impervious to attack from sulphur and its compounds. Can withstand +1314°C. Far superior to elements ordinarily used in furnaces of this temperature range. Readily replaceable. Watt density designed for balanced run-up and maximum element life.

ELEMENT PLATES: Ribbed, sturdy — crack-resistant — grooved to support Modella elements along entire length. Surrounds all four sides.

ILLUMINATED CONTROL DIAL: Lighted dial with green control action indicator light.

REMOVABLE LOAD TRAYS: Molded of Hi-Heat Electrical Refractory. Standard equipment. Two supplied with Model E-514A-3 and three for Model E-555C-3.

DOOR: Double sealed-insulated and counterweighted. New, efficient ventilation to reduce temperature. Also simplifies firebrick replacement if ever needed. Special perforated steel shield minimizes surface temperature.

DUAL ELEMENT THERMOCOUPLE: One for control, one for OTP. Break protection: furnace shuts down if T/C fails.

WIRING: Stainless terminals outside heating zone eliminate corrosion; easier servicing. Heavy copper asbestos covered range wire used for electrical wiring. Ready for use. Complete to N.E. Code, as amended. Terminal box.

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Total VA	Voltage 50/60 Hz. A.C. Single Phase	Shipping Weight Lbs. (Kg.)	Complete Price With OTP
E-514A-3	5¼ (13)	10 (25)	4½ (11)	17 (43)	21 (53)	22 (55)	2100	*120 V.	85 (38)	$1085.00
E-555C-3	5¼ (13)	15 (38)	4½ (11)	17 (43)	26 (65)	22 (55)	3000	**240 V	110 (50)	1180.00

*Model No. E514A-3 available for 240 V or 208 V./1 Ph. We will supply a separate autoformer package complete with line cord and plug. Simple installation. Specify Part No. E17E-1-3. . . . . $210.00 Each

**Model No. E555C-3 will operate reliably when connected to 208 volt service with minor wiring change. A 25% reduction in element power will result.

OPTIONAL AND RECOMMENDED ACCESSORIES — SPARE PARTS

Please give unit model no., and voltage when ordering accessories

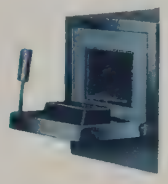
EXTRA LOAD TRAYS: Part No. M23-E2. . . . . $8.50 Each
For E-514A-3, 2 required
For E-555C-3, 3 required

EXTRA HEATING ELEMENTS:
For E-514A-3 (one set of 4 required)
Cat. No. FH3-12 . . . . . $102.00 Each Set
For E-555C-3 (one set of 4 required)
Cat. No. FH3-13 . . . . . $135.00 Each Set

EXTRA THERMOCOUPLE:
Part No. C11B-3-7 . . . . . $30.00 Each

DOOR INSERT REPLACEMENT: One-piece high temperature quality firebrick quickly and easily slipped into place. For either model.

Part No. M23-J2 . . . . . $25.00 Each



INCONEL MUFFLE: Flange type, as illustrated. Has two ⅛" Inconel tubes, one with compression fitting to accommodate thermocouple and one for inert gas introduction. Door plug inconel-lined. NOTE: Operation with muffle is limited to +1850°F. MUFFLES DO NOT PERMIT FURNACES TO BE USED FOR INERT GAS PROCESSING. THEY DO NOT PREVENT OXIDATION.

For E-514A-3 (I.D.: 4¾" W. x 4" H. x 9⅝" D.)
Cat. No. NMFL-125 . . . . . $195.00
For E-555C-3 (I.D.: 4¾" W. x 4" H. x 14⅝" D.)
Cat. No. NMFL-126 . . . . . $235.00

BLUE M

Improved *Lab-Heat* Box Type MUFFLE FURNACES

with solid-state VARI-WATT power level control*

COMPLETELY REDESIGNED
Greater safety, compact, modern.

NEW VARI-WATT POWER LEVEL CONTROL
Exclusive Blue M solid-state design.
No contacts, no clock motors.

CONTINUOUS OPERATION
+66°C. to +1000°C. (+150°F. to +1832°F.)

INTERMITTENT OPERATION
+66°C. to +1093°C. (+150°F. to +2000°F.)

MODELLA ELEMENTS—ALL FOUR SIDES
Non-oxidizing, impervious to attack from sulphur and its compounds. Provides steady, balanced run-up.

FIREBRICK INSULATION
2½ in. blocks on all six sides.

STAINLESS STEEL CABINET AND DOOR ENCASEMENT
Excellent resistance to corrosion and heat.

SPECIAL SAFETY SHIELDS
Surrounds cabinet and door front.

COUNTERWEIGHTED DOOR
Has safety shield.

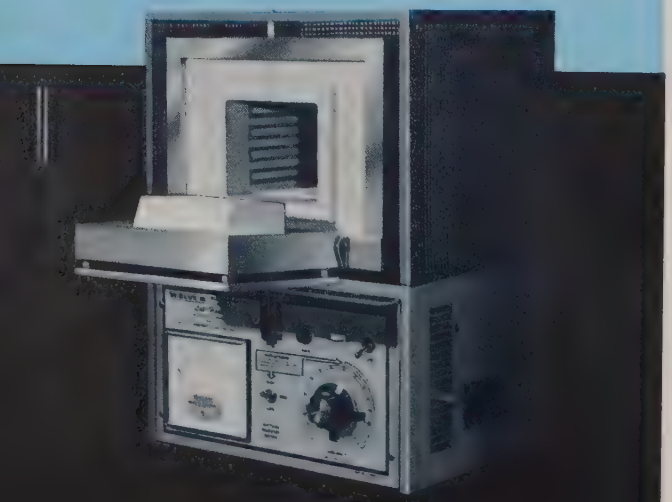
DOOR SWITCH
Automatically shuts down furnace when door is opened.

LARGE PYROMETER, 3½" SCALE
D'Arsonval movement.
Millivoltmeter type, Alnico magnet, graduated in Centigrade and Fahrenheit. Zero adjustment.
Two C/A thermocouples included; one as a spare.

MANUAL HIGH-LOW SWITCH

MEMORY RING® DIAL

*Patents Pending



NEW ADVANCED DESIGN OFFERS GREATER SAFETY, SOLID-STATE OPERATION, MODERN COMPACT PROFILE—AT TRUE BUDGET COST!

This series of furnaces—long one of the best known and most popular in the laboratory field—has now been completely redesigned to become an even better bargain than ever before. Building upon established and proven engineering concepts, Blue M has added many new features which put these furnaces into a class apart. In the low-cost furnace field, they stand alone

The new VARI-WATT Power Level Control, for example, brings true solid-state operational efficiency to the budget furnace market. It features a Zener diode which provides voltage stabilization while unijunction full phase firing circuitry permits power to be manually adjusted from full off to full on steplessly. The control works in conjunction with a high-low switch which allows the operator to pick voltage ranges of 50% or 100% of maximum. Control dial permits utilization of any desired amount of power from 5% to 100% at any of the power selector switch settings. Patented Memory Ring Dial provides a convenient means to record desired settings for future reference.

Rivaling the control in importance are the many new safety features now standard on these furnaces. These include a perforated steel protective shield around the work cabinet and on the face of the door. This minimizes the temperatures of surfaces to which the operator is normally exposed, even when the furnace is in service near the upper limits of its range. Operator safety is further insured by a new door switch which automatically shuts down the unit if the door is opened. A protective shield extending out from the face of the furnace helps safeguard instrumentation against accidental spillage.

These improvements and the many other features described on the opposite page have been incorporated into an entirely new compact and modern physical configuration. These attractive models not only occupy much less work space, but their smart appearance will enhance any laboratory.

Shipped complete, ready to operate, these furnaces are designed for such non-critical applications as ash determinations, fusions, precipitate ignition, heat-treating small parts and optical glass, and for dental work. These furnances have a *manual Power Level Setting Control only*. See previous pages for similar units with direct setting temperature *control*.

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY

SEE PAGE 16

BLUE M

GENERAL SPECIFICATIONS AND PRICES

VARI-WATT POWER LEVEL CONTROL: Solid-state with Zener diode for voltage stabilization. Unijunction full phase firing circuitry permits stepless manual adjustment from full off to full on. Memory Ring Dial.

HIGH-LOW SWITCH: Works in conjunction with control, allows operator to select power levels of 50% or 100% of maximum.

VOLTMETER: Power input indication. Simplifies power level setting.

CONSTRUCTION: Cabinet and door encasement Type 304, 18-8 stainless for maximum corrosion resistance. Special perforated steel panels, finished in attractive blue baked-on enamel, surround cabinet and face of door. Surface temperatures are minimized. Specially designed louvers in matching blue enameled steel base provides exclusive Cross-Flo Ventilation for ambient safety of all control components.

INSULATION: Extra heavy, 2½ in. thick blocks of high temperature firebrick on all six sides.

DOOR: Double sealed—insulated and counterweighted. Counterweight is black enameled steel. New, efficient ventilation to reduce temperature. Also simplifies firebrick replacement if ever needed. Special perforated steel shield minimizes surface temperature.

SAFETY DOOR SWITCH: Automatically shuts down furnace when door is opened.

MODELLA HEATING ELEMENTS: Non-oxidizing, non-flaking and practically impervious to attack from sulphur and its compounds. Can withstand +1314°C. temperature. Modella elements are far superior to the type of elements ordinarily used in furnaces of this temperature range and are readily replaceable. Watt density modified as needed for balanced run-up and maximum element life.

ELEMENT PLATES: Ribbed, sturdy—crack-resistant—grooved to support Modella elements along entire length.

REMOVABLE LOAD TRAYS: Molded of Hi-Heat Electrical Refractory. Standard equipment. One, two, or three supplied depending on furnace depth. Model M10A-2A receives (1); Model M15A-2A and M25A-2A, (2); Model M30A-2C, (3).

PYROMETER: Millivoltmeter type—has dual scale range 0°C. to +1100°C./0°F. to +2000°F., 20°F. graduations. Has zero adjustment.

NEON PILOT LAMP: Red indicates furnace in operation.

THERMOCOUPLES (2): Chromel/Alumel thermocouples and two-hole insulators supplied with furnace. Extra thermocouple for replacement included at no charge.

WIRING: Stainless steel terminals are placed outside the heating zone to eliminate corrosion and for easier servicing. Heavy copper asbestos covered range wire used for electrical wiring. Ready for instant use. Six-foot rubber covered cord and rubber plug furnished on Model M10A-2A. All others supplied with terminal box.

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Total VA	Voltage 50/60 Hz. A.C. Single Phase	Shipping Weight Lbs. (Kg.)	Complete Price
M10A-2A	4 ⅜ (11)	4¾ (11)	4 (10)	16 (40)	15 (38)	20 (51)	1200	*120 V	55 (25)	$230.00
M15A-2A	4⅜ (11)	9½ (24)	4 (10)	16 (40)	20 (51)	20 (51)	1800	*120 V	70 (32)	315.00
M25A-2A	5⅛ (13)	10 (25)	4½ (11)	17 (43)	21 (53)	22 (55)	2100	*120 V.	85 (38)	492.00
M30A-2C	5⅛ (13)	15 (38)	4⅜ (11)	17 (43)	26 (65)	22 (55)	3000	**240 V.	110 (50)	595.00

*Models available for 240 V or 208 V /1 Ph We will supply a separate autoformer package complete with line cord and plug Simple installation

For Model No. M10A-2A and M15A-2A
Specify Part No. E17E-1-2 ..... $120.00 Each

For Model No. M25A-2A
Specify Part No. E17E-1-3 ..... $210.00 Each

**Model M30A-2C will operate reliably when connected to 208 volt service. A 25% reduction in element power will result

OPTIONAL AND RECOMMENDED ACCESSORIES — SPARE PARTS

Please give unit model no., and voltage when ordering accessories

EXTRA LOAD TRAYS
For M10A-2A and M15A-2A
Part No. M23-E1 ..... $8.00 Each
For M25A-2A and M30A-2C
Part No. M23-E2 ..... $8.50 Each
NOTE: Model M10A-2A requires 1 tray. Models M15A-2A and M25A-2A require 2. Model M30A-2C requires 3.

DOOR INSERT REPLACEMENT: One-piece high temperature quality firebrick quickly and easily slipped into place
For M10A-2A and M15A-2A. Part No. M23-J1 . $18.00 Each
For M25A-2A and M30A-2C. Part No. M23-J2 . $25.00 Each

EXTRA THERMOCOUPLE: Part No. C11B-3-8... $7.50 Each

EXTRA INDICATING PYROMETER
Part No. CO1D-5 ..... $36.00 Each

REPLACEMENT ELEMENTS: As described above.
For M10A-2A (set of 2). Cat. No. FH2-14... $32.00 Each Set
For M15A-2A (set of 2). Cat. No. FH2-15.. 42.00 Each Set
For M25A-2A (set of 4). Cat. No. FH3-12.. 102.00 Each Set
For M30A-2C (set of 4) Cat No FH3-13. 135.00 Each Set

Shipping weights shown are for standard models Units ordered with accessories may require special packing, increasing shipping weight slightly

BLUE M

Stabil-Glow®

FLOOR MODEL

Box Type
FURNACE

with

POWER-O-MATIC 80®
PATENTED

solid-state SCR proportioning control system, separate indication and built-in overtemperature protection

CONTINUOUS OPERATION
+150°C. to +1093°C. (+2000°F.)

INTERMITTENT OPERATION
To +1204°C. (+2200°F.)

UNIFORMITY: ±1½% of setpoint

CONTROL ACCURACY: ±2°C.

HEAT-UP TIME
To +1093°C.: 90 min.

EXCLUSIVE BLUE M SOLID-STATE CONTROL
Designed specifically for precise regulation of elevated temperatures

BUILT-IN MAX-SET OVERTEMPERATURE PROTECTION
Indicating type, activated by its own thermocouple. Exclusive Blue M time-delay feature eliminates nuisance tripping.

10-TURN POTENTIOMETER
Insures fine setability to match capability of control

SWING-AWAY DOOR WITH SAFETY SHUT-OFF
Refractory seals chamber interior

ELAPSED TIME METER

MAIN FUSED DISCONNECT SWITCH

VOLTMETER, MAIN SWITCH, PILOT LIGHTS

THE ULTIMATE IN PERFORMANCE, OPERATING EASE AND CONTROL ACCURACY AT TEMPERATURES TO +1204°C. (+2200°F.)

By combining proven furnace design concepts with the inherent superiority of the patented POWER-O-MATIC 80 Solid-State Proportioning Control System, Blue M has developed a quality furnace superior to those employing conventional instrumentation with moving parts and contactors. Unequalled straight-line performance is assured, temperature run-up and stabilization are extremely fast with element life improved considerably.

POWER-O-MATIC 80 is also simple in design and in operation. Even inexperienced personnel can quickly and surely place the chamber in service—and keep it operating—with a minimum of supervision. Calibration and desired operating parameters are also maintained for extended periods without adjustment.

A single knob simplifies temperature setting. Bias controls or multi-knob adjustments are not needed. A 10-turn potentiometer working in conjunction with Blue M's patented Memory Ring® Temperature Calibrating Dial assures unmatched setability and repeatability. Separate reference charts are unnecessary. A separate dual scale indicating overtemperature protection system—functioning in response to its own thermocouple—provides the operator with an immediate and accurate representation of actual chamber conditions—regardless of control setting. In addition, it features Blue M's unique MAX-SET™ time-delay circuitry described on page 14 which prevents nuisance tripping. A built-in voltmeter and elapsed time meter add to the operator's convenience. By having the control and overtemperature protection operating separately, Blue M has achieved a degree of accuracy, simplicity and safety never before possible in a furnace of this type.

The furnace has wide application in such critical operations as machine shops and chemical, optical, environmental and metallurgical facilities involved in heat-treating ferrous/non-ferrous tools and dies, ignition of precipitates, ash determinations, fusions, incinerations, glass and ceramic processing and similar work where the fine operating characteristics of the POWER-O-MATIC 80 Control are required.

For processing requiring temperatures to +1620°C. (+2950°F.), please see the following pages for a description of our Rad-O-Glow Globar® Furnace also equipped with POWER-O-MATIC 80 Control.

EQUIPMENT COVERED BY OUR EXCLUSIVE
PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM
WARRANTY
SEE PAGE 16

BLUE M

GENERAL SPECIFICATIONS AND PRICES

PATENTED BLUE M INSTRUMENTATION

POWER-O-MATIC 80 Solid-State SCR Proportioning Control System. Patented Blue M control (described on pages 12 and 13) offers infinitely proportional, true straight-line performance throughout the unit's range. Designed specifically for control of elevated temperatures. Including a 10-turn potentiometer and working in conjunction with Blue M's patented Memory Ring® Temperature Calibrating Dial, POWER-O-MATIC 80 offers an expanded scale length of over 70" for a remarkable setability of 0.25% of span. Dual scale in °C. and °F.

BUILT-IN OVERTEMPERATURE PROTECTION: Indicating type, dual scale with range to complement main control and installed conveniently adjacent to it. Indication accuracy ±1% of full scale. Provides constant monitoring over entire span; you see what the chamber temperature actually is at all times. Operates independently of control in response to its own thermocouple. Features exclusive Blue M MAX-SET time-delay circuitry and operation as described on page 14.

THERMOCOUPLES (2): One for control, one for OTP. Break protection: unit shuts down if T/C fails.

CONSTRUCTION: Housing of welded heavy gauge steel plate, reinforced throughout. Instrument compartment well ventilated to reduce heat build-up around control and wiring within safe specified range. Baked-on beige enamel exterior finish.

6" DUAL INSULATION: High temperature firebrick, 4½ in. thick, plus 1½" of Therm-O-Block on all six sides. Minimizes heat loss.

MODELLA HEATING ELEMENTS: Low watt density design, helically coiled for long life. Non-flaking and practically impervious to attack from sulphur and its compounds. Wire withstands +2400°F. Elements on all four sides, but reversed on bottom to form smooth base for placement of material to be treated. Easily and individually replaced if ever necessary.

SWING-AWAY DOOR: Double wall design, ventilated to keep cool during furnace operation. Firebrick plug fits into furnace throat to seal interior. Door opens wide for full access to interior. Door bracket and supports black enamel. Phenolic handle. Protective shelf below door.

SAFETY SHUTOFF: Automatically breaks circuit to shut off elements when door is opened.

MOLDED REFRACTORY DOOR JAMB: Superior to ordinary firebrick customarily used. Long lasting, clean.

ELEMENT PLATES: Ribbed, extra thick, crack-resistant. Grooved to support elements along entire length. Made of high-heat electrical refractory fired at +2750°F.

REMOVABLE LOAD TRAYS: Molded of high-heat electrical refractory. Three supplied.

ELAPSED TIME METER: Shows exactly how many hours furnace has actually operated.

WIRING: 120 V. isolated control circuit. All power lines are fused for maximum safety and protection through main fused disconnect switch. Wiring totally enclosed and meets amended N.E. Code. Terminal box.

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Total KVA	Voltage 50/60 Hz. A.C. Single Phase	Shipping Weight Lbs. (Kg.)	Complete Price
8850C-1	10	18	10	30	42	60	14.0	*240 V.	800	$3130.00
8850D-1	(25)	(45)	(25)	(76)	(105)	(152)	12.0	480 V.	(363)	3215.00

*Model 8850C will operate reliably when connected to 208 volt service, with control transformer tap change. A 25% reduction in element power will result

OPTIONAL AND RECOMMENDED ACCESSORIES — SPARE PARTS

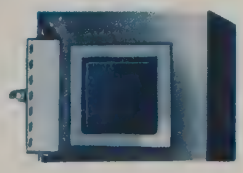
Please give unit model no., and voltage when ordering accessories

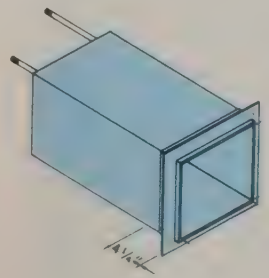
EXTRA HEATING ELEMENTS: Available in complete sets of 4: top, bottom and sides. Price on request.

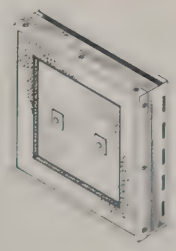
EXTRA THERMOCOUPLE: As described above
Specify Part No. C11B-3-7 ..... $30.00 Each

INCONEL MUFFLES: The addition of one of these quality-built Inconel Muffles is an efficient, economical means to protect heating elements and workload from dirt and contaminants during processing. Constructed of No. 11 gauge material, welded with ⅛" Inconel gas inlet pipes and ⅛" Inconel pipe for thermocouple entry. Work area begins 4¼" back into muffle proper as shown in sketch. Inner face of door has refractory lining. Area with refractory lining is indicated in door sketch. Muffle I.D.: 8¾" W. x 17" D. x 9" H. PLEASE NOTE: MUFFLES DO NOT PERMIT FURNACES TO BE USED FOR INERT GAS PROCESSING. THEY DO NOT PREVENT OXIDATION. *Use of muffle limits furnace operating range to +1850°F.*
Specify Cat. No. NMFL-123 ..... $910.00 Each

EXTRA LOAD TRAYS: As described above. Three required.
Specify Cat. No. LT-105 ..... $13.00 Each







BLUE M Electric Company CORPORATE HEADQUARTERS: BLUE ISLAND, ILLINOIS 60406

BLUE M
RAD-O-GLOW

High Temperature Box Type GLOBAR® FURNACES with POWER-O-MATIC® 80

PATENTED

solid-state SCR proportioning control system, separate indication and built-in overtemperature protection

EFFICIENT CONTINUOUS OPERATION
+649°C. to +1538°C. (+2800°F.)

INTERMITTENT OPERATION
To +1620°C. (+2950°F.)
NOTE: For +3000°F. operation, check with factory.

CONTROL ACCURACY: ±3°C.

EXCLUSIVE BLUE M SOLID-STATE CONTROL
Designed specifically for precise regulation of elevated temperatures

BUILT-IN MAX-SET OVERTEMPERATURE PROTECTION
Indicating type, activated by its own thermocouple. Exclusive Blue M time-delay feature avoids nuisance tripping.

10-TURN POTENTIOMETER
Insures fine setability to match capability of main control

PREMIUM GRADE HEATING ELEMENTS
Matched set silicon carbide Carborundum SGR Series

SWING-AWAY DOOR WITH SAFETY SHUTOFF
Encased in stainless
Refractory seals chamber interior

ELAPSED TIME METER

MAIN FUSED DISCONNECT SWITCH

VOLTMETER, MAIN SWITCH, PILOT LIGHTS

UNEQUALED DEPENDABILITY, STABILITY AND ACCURACY AT ELEVATED TEMPERATURES TO +1620°C. (+2950°F.)

The utilization of Blue M's patented POWER-O-MATIC 80 Solid-State Proportioning Control System with a furnace of proven engineering excellence has resulted in a high temperature processing facility without equal. The control drives a saturable reactor proportioning system, enabling full advantage of the best features of both systems to be realized. The combination provides a control with an extremely narrow proportional band width and virtually no RFI. Also, the constant current characteristics of the saturable reactor system levels out current variations due to the normal wide resistance change undergone by SGR premium grade Globar elements with temperature change and aging. Blue M's low watt density design is one-half that ordinarily recommended, allowing the unit to be operated without overstressing or overloading the elements. Manual tap changing is not required, simplifying operation since the furnace can be run up to maximum temperature unattended. There are no tap switches or large power line contactors. The result in unexcelled straight-line temperature control—with Globar element service life increased by approximately 150 to 200%.

POWER-O-MATIC 80 is also simple in design and in operation. Even inexperienced personnel can quickly and surely place the chamber in service—and keep it operating—with a minimum of supervision. Calibration and desired operating parameters are also maintained for extended periods without adjustment.

Exclusive design includes a 10-turn potentiometer working in conjunction with Blue M's patented Memory Ring® Temperature Calibrating Dial to provide extremely fine setability. A separate dual scale indicating overtemperature protection system, functioning in response to its own thermocouple, provides an instantaneous and accurate representation of actual chamber conditions—regardless of control setting. In addition, it features Blue M's unique MAX-SET™ time-delay circuitry described on page 14 which eliminates nuisance tripping. With control, and overtemperature protection functioning separately, this furnace assures a level of control accuracy, operational simplicity and safety never before possible.

The furnace is recommended for operations at temperatures from +1500°F./+1600°F. and higher, and is ideal for hardening high speed steels, annealing alloy steels, sintering of powdered metals, copper brazing, aging, forging, laboratory procedures involving ceramics, and heat treatment of ferrous and non-ferrous alloys.

For processes requiring lower temperatures, please see the previous pages describing our Stabil-Glow Box Type Furnaces also equipped with POWER-O-MATIC 80 Control. They have a range to +1204°C. (+2000°F.)

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY BLUE M SEE PAGE 16

BLUE M

SEE PAGES 12 AND 13 FOR FULL DESCRIPTION OF POWER-O-MATIC 80 CONTROL SYSTEM.

GENERAL SPECIFICATIONS AND PRICES

PATENTED BLUE M INSTRUMENTATION

POWER-O-MATIC 80 Solid-State SCR Proportioning Control System. Patented Blue M control (described on pages 12 and 13) offers infinitely proportional, true straight-line performance throughout the unit's range. Designed specifically for control of elevated temperatures. Including a 10-turn potentiometer and working in conjunction with Blue M's patented Memory Ring® Temperature Calibrating Dial, POWER-O-MATIC 80 offers an expanded scale length of over 70" for a remarkable setability of 0.25% of span. Dual scale in °C. and °F.

BUILT-IN OVERTEMPERATURE PROTECTION: Indicating type, dual scale with range to complement main control and installed conveniently adjacent to it. Indication accuracy ±1% of full scale. Provides constant monitoring over entire span; you see what the chamber temperature actually is at all times. Operates independently of control in response to its own thermocouple. Features exclusive Blue M MAX-SET time-delay circuitry and operation as described on page 14.

THERMOCOUPLES(2): One for control, one for OTP. Break protection: unit shuts down if T/C fails.

CONSTRUCTION: Housing of welded extra heavy steel plate with structural reinforcement member. 3/4 in. isolated front plate painted with high temperature aluminum. Perimeter of furnace opening isolated from plate and housing to prevent distortion. Baked-on beige enamel exterior finish.

SGR GLOBAR HEATING ELEMENTS: Premium grade, matched set. Spiral groove, mounted vertically from bottom. Minimize heat loss. Special high density recrystallized silicon carbide assures long service life. Easily replaceable.

FIREBRICK INSULATION: Full 7 in. thick with full +3000°F. service temperature and lower thermal conductivity. Reduces heat losses and K.W. requirements.

SWING-AWAY DOOR: Stainless encasement with 7 in. refractory insulation. Firebrick fits into furnace throat and seals furnace interior. Bracket and supports finished in baked-on black enamel.

SAFETY SHUTOFF: Automatically breaks circuit to shut off elements when door is opened.

EXHAUST SYSTEM: High temperature ceramic tube, 1 in. diameter, to vent fumes and vapors from chamber. Has plug insert for sealing when venting is not required.

ELAPSED TIME METER: Shows exactly how many hours furnace has actually operated.

WIRING: 120 V. isolated control circuit. All power lines are fused for maximum safety and protection through main fused disconnect switch. Wiring totally enclosed and meets amended N.E. Code. Terminal box.

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Total KVA	Voltage 50/60 Hz. A.C. Single Phase	Shipping Weight Lbs. (Kg.)	Complete Price
RG-3080C-1	8 (20)	12 (31)	8 (20)	30 (76)	36 (90)	60 (152)	12.0	240 V.	1500 (681)	$5920.00

OPTIONAL AND RECOMMENDED ACCESSORIES — SPARE PARTS

Please give unit model no., and voltage when ordering accessories

REPLACEMENT ELEMENTS: Complete set of 8 SGR GLOBARS. For your convenience, we recommend the purchase of an extra set of elements with the furnace to be replaced when required. Please contact the factory for price of Part No. EO5C-2.

REPLACEMENT PLATINUM THERMOCOUPLE ASSEMBLY: Complete with protection tube and head. Please contact the factory for price of Part No. C11B-4-3.

BLUE M

Lab-Size

RAD-O-GLOW

BENCH MODEL

High Temperature

Box Type

GLOBAR® FURNACE

with solid-state control and built-in overtemperature protection

IMPROVED SOLID-STATE CONTROL POTENTIOMETER
Indicating type, provides good control throughout extended range

BUILT-IN MAX-SET OVERTEMPERATURE PROTECTION
Solid-state, complements main control for safety of workloads and equipment

CONTINUOUS OPERATION
+788°C. to +1482°C. (+2700°F.)

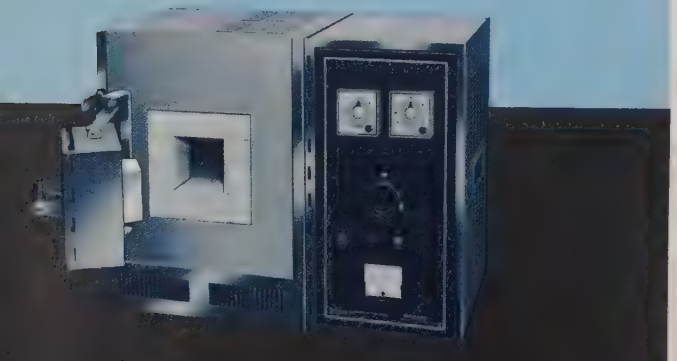
INTERMITTENT OPERATION
To +1538°C. (+2800°F.)
Uses (8) Globar Elements
Minimizes Shock . . .
Assures Longer Life . . .
Provides Faster Response

BUILT-IN MULTIPLE STEP TRANSFORMER
Permits rapid selection of voltage
Compact and rugged

INDICATING AMMETER
Measures line current

UNIFORM TEMPERATURES

WIRING—ENCLOSED AND COMPLETE
Meets N.E. Code, as amended.
Terminal box provided.



SAFETY SHUT OFF SWITCH AND BUILT-IN OVERTEMPERATURE PROTECTION NOW STANDARD FOR GREATER SAFETY AND OPERATIONAL EFFICIENCY

**QUALITY CONSTRUCTION—
AUTOMATIC OPERATION—
MAXIMUM SAFETY**

This completely re-engineered, lab-size, GLOBAR FURNACE comes ready to use complete with built-in overtemperature protection. Provides 60 square inches of radiation surface and incorporates Delta Globar elements, vertically mounted for faster response and longer service life. These furnaces ARE NOT OVER-RATED with respect to temperatures indicated above. No premature burnout at maximum temperatures. A practical heat-shielded Swing-Away door with alloy encasement provides operator protection when using furnace. Safety shutoff cuts power to elements when door is opened.

As a manufacturer of quality high temperature equipment, Blue M has directed special attention to every design detail to obtain maximum service life . . . maximum operator convenience . . . maximum utility and safety. A fine, modern addition to any facility where high temperature work to high standards is handled.

RECOMMENDED FOR:
• HARDENING HIGH SPEED STEELS • ANNEALING ALLOY STEELS • SINTERING POWDERED METALS • COPPER BRAZING • AGING • FORGING • LABORATORY PROCEDURES INVOLVING CERAMICS, ETC.

The top quality components described in detail on the opposite page mean optimum performance and reliability. Small compact design—complete—and ready to use. Extra Globars, Extra Platinum Thermocouples and Floor Stands available. Inconel muffles are available on special request.

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY BLUE M

SEE PAGE 16

BLUE M

GENERAL SPECIFICATIONS AND PRICES

IMPROVED INSTRUMENTATION

MAIN CONTROLLER: Solid-state indicating temperature control of potentiometric design featuring advanced integrated circuitry and time proportioning. Shock and vibration resistant. Illuminated direct read-out dial with 6" scale provides setting accuracy to within 0.5% of scale. Indication is 10% of span on either side of setpoint. Example: if temperature is set at +300°C. on a controller with a 600°C. span, indicator registers actual chamber temperature at any point between +240°C. and +360°C. Indication accuracy is ±1½% of full scale. Scales in Centigrade standard; Fahrenheit available when specified at time of order.

BUILT-IN OVERTEMPERATURE PROTECTION: Similar solid-state instrument complements main control and conveniently installed adjacent to it. Features exclusive Blue M MAX-SET™ time-delay circuitry and operation as described on page 14. Easily set. Positive protection at all times . . . standard on every unit.

CONSTRUCTION: Heavy gauge steel surrounds quality +3000°F. firebrick. ISOLATED steel front plate painted with high temperature aluminum. Exterior finished in baked-on beige enamel.

HEATING ELEMENTS: Eight Globar elements. Uniquely mounted in vertical position and having adequate air exposure . . . provides faster response, longer element life; less affected by shock, less possibility of burnout due to spillage. Replaceable.

TRANSFORMER: 3 KVA, multiple steps. Assures maximum element life.

TAP SWITCH AND AMMETER: Multiple steps; simplifies operation plus large indicating 0 to 30 ampere ammeter.

NEON PILOT LAMPS (2): Red indicates power is on; amber indicates element operation.

MERCURY RELAY: Silent and fast operating. No exposed arc, dust and moisture-proof at all times. Hermetically sealed, mercury to mercury, make and break in a hydrogen atmosphere. Double pole type.

THERMOCOUPLE AND THERMOCOUPLE BREAK PROTECTION: 13% platinum thermocouple in ceramic protection tube. Furnace automatically shuts down in event of thermocouple burnout or failure. Instrument protected by separate fuse.

DOOR: 18-8 alloy with double hinged feature for side swing AWAY from user. Heat-shielded design for operator safety. Special black bakelite handle remains cool while furnace is in use. Door hardware finished in baked-on black enamel.

SAFETY SHUTOFF: Automatically breaks circuit to shut off elements when door is opened.

QUALITY INSULATION: 4½ in. thick, +3000°F. best quality, lightweight insulating refractories. Prevent excessive heat losses. Built-in refractory expansional joints to compensate for elevated temperatures.

VENTILATED CONTROL COMPARTMENT: With heat breaker bars; houses electronic instrumentation and all electrical components. Alloy terminal bar connectors utilized.

WIRING: Enclosed, meets N.E. Code, as amended. Terminal box provided to connect power source.

Model Number	Inside Dimensions Inches (Cm.) W.	D.	H.	Overall Dimensions Inches (Cm.) W.	D.	H.	Total VA	*Voltage 50/60 Hz. A.C. Single Phase	Shipping Weight Lbs. (Kg.)	Complete Price With OTP
RG-2090A-3	4 (10)	8 (20)	4 (10)	28 (70)	26 (65)	22 (55)	2600	120 V.	450 (204)	$2415.00

*Available for 240 V or 208 V./1 Ph We will supply a separate autoformer package complete with line cord and plug. Simple installation

Specify Part No E17E-1-3. . . $210.00 Each

FOR LARGER FLOOR MODEL RAD-O-GLOW GLOBAR FURNACES, INCLUDING UNITS WITH THE PATENTED BLUE M POWER-O-MATIC 80® SOLID-STATE PROPORTIONING CONTROL, SEE PAGES 152/153 AND 156/157.

OPTIONAL AND RECOMMENDED ACCESSORIES — SPARE PARTS

Please give unit model no., and voltage when ordering accessories

REPLACEMENT ELEMENTS: Complete set of 8 GLOBARS. For your convenience, we recommend the purchase of an extra set of elements with the furnace to be replaced when required. Please contact factory for price of Part No. EO5C-1.

CABINET TYPE FLOOR STAND: Constructed of heavy steel; with auxiliary shelf and door. Finished same as furnace. Overall dimensions: 30" W. x 22" D. x 35" H.
Cat. No. FS-166A $130.00

INCONEL MUFFLES: Are available on special request. Please contact the factory for complete details.

REPLACEMENT PLATINUM THERMOCOUPLE ASSEMBLY: Complete with protection tube and head. Please contact the factory for price of Part No. C11B-4-2.

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly

BLUE M

Improved

RAD-O-GLOW

High Temperature Box Type

GLOBAR® FURNACES

with solid-state control and built-in overtemperature protection

IMPROVED SOLID-STATE CONTROL POTENTIOMETER
Indicating type, provides good control throughout extended range

BUILT-IN MAX-SET OVERTEMPERATURE PROTECTION
Solid-state, complements main control for safety of workloads and equipment

VERTICALLY MOUNTED HEATING ELEMENTS
Silicon carbide Carborundum SGR Series

CONTINUOUS OPERATION
+649°C. to +1510°C. (+2750°F.)

INTERMITTENT OPERATION
To +1593°C. (+2900°F.)
NOTE: For +3000°F. operation check with factory.

SWING-AWAY DOOR
Stainless steel encasement
Refractory seals furnace interior

ISOLATED TYPE TAP CHANGING TRANSFORMER
Switching performed in low voltage secondary.

POWER TAP SWITCH
Silver to silver non-shorting contacts

AMMETER FOR MEASURING LINE CURRENT

ELAPSED TIME METER

WIRING—COMPLETE AND COMPACT

RADICALLY IMPROVED! NOW FEATURES NEW SOLID-STATE INSTRUMENTATION AND BUILT-IN OVERTEMPERATURE PROTECTION IN BOTH POPULAR SIZES!

A CUSTOM INSTALLATION at production price. Here, in one practical package, is a complete HIGH SPEED furnace with all accessories. Blue M's RAD-O-GLOW improved Globar furnaces meet all the requirements and may be used for: HARDENING HIGH SPEED STEELS, ANNEALING ALLOY STEELS, SINTERING OF POWDERED METALS, COPPER BRAZING, AGING, FORGING, LABORATORY PROCEDURES INVOLVING CERAMICS, HEAT TREATMENT OF FERROUS AND NON-FERROUS METALS.

Major improvements make these quality units safer and more accurate, efficient and economical to operate than ever.

New vertically mounted spiral groove silicon carbide elements cut heat loss to a minimum—improve temperature uniformity, resist oxidation, last longer.

New solid-state control system has built-in time proportioning—assures finer control, less undershooting and overshooting. Built-in solid-state overtemperature protection, now standard, safeguards furnace and workloads. Simply set single tap switch and controller. Furnace is automatically held to a fine degree of control.

New swing-away door is more convenient—has refractory lining which effectively seals furnace throat. Safety shutoff cuts power to elements when door is opened.

These important advances—plus larger chamber size, new exhaust vent, and higher temperature refractory—all complement the many features already standard on these units. The isolation type transformer, for example, which is used to step down line voltage for heating elements. Low level voltage is switched by a heavy-duty tap switch. Complete safety is assured because switch shaft is electrically "dead". Maximum furnace life with minimum cost is guaranteed.

Despite their many improvements and features, these units are competitively priced. We recommend them to any laboratory of production department needing high temperature furnaces built to high quality standards.

For new Globar Furnaces with Blue M's patented POWER-O-MATIC 80® Solid-State Proportioning Control, see pages 152-153.

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY BLUE M

SEE PAGE 16

BLUE M

GENERAL SPECIFICATIONS AND PRICES

IMPROVED INSTRUMENTATION

MAIN CONTROLLER: Solid-state indicating temperature control of potentiometric design featuring advanced integrated circuitry and time proportioning. Shock and vibration resistant. Illuminated direct read-out dial with 8" scale provides setting accuracy to within 0.5% of scale. Indication is full 50% of span on either side of setpoint. Example: if temperature is set at +1400°C. on a controller with a 1600°C. span, indicator registers actual chamber temperature at any point between +600°C. and maximum. Indication accuracy is ±1% of full scale. Dual scale in °C. and °F.

BUILT-IN OVERTEMPERATURE PROTECTION: Similar solid-state instrument complements main control and conveniently installed adjacent to it. Features exclusive Blue M MAX-SET ™ time-delay circuitry and operation as described on page 14. Easily set. Positive protection at all times . . . standard on all units. Dual scale in °C. and °F.

CONSTRUCTION: Housing welded from extra heavy steel plates with structural reinforcement members, ¾ in. isolated front plate painted with silicone base high temperature aluminum. Perimeter of furnace opening is isolated from plate and housing to prevent distortion. Exterior finish is baked-on beige enamel.

SGR GLOBAR HEATING ELEMENTS: Matched set. Spiral groove elements mounted vertically from bottom. Eliminate top holes formerly needed, greatly reducing heat loss. Special high density recrystallized silicon carbide assures long service life. Easily replaceable.

TAP CHANGING TRANSFORMER AND AMMETER: Only 8 taps required on newly designed isolation transformer. Secondary completely isolated from power line. Switching performed in low voltage secondary. Obsoletes 36 step auto-transformer types. Quality ammeter indicates line current.

ELAPSED TIME METER: Shows number of hours furnace has actually operated.

POWER TAP SWITCH: Arc-proof ceramic bodies with large silver to silver contacts. Switch shafts are electrically "dead". Non-shorting rotary mechanism with slow-break, quick-make action.

MERCURY RELAY: Silent and fast operating. No exposed arc; dust and moisture-proof at all times. Hermetically sealed, mercury to mercury, make and break in a hydrogen atmosphere. Double pole type.

THERMOCOUPLE AND THERMOCOUPLE BREAK PROTECTION: Platinum; 13% Rhodium thermocouple in ceramic protection tube. Furnace automatically shuts down in event of thermocouple burnout or failure. Instrument protected by separate fuse.

SWING-AWAY DOOR: Replaces vertical rise type. Has 7 in. refractory insulation encased in stainless steel with heat shield; fire-brick fits into furnace throat and seals furnace interior. Bracket and supports finished in baked-on black enamel.

SAFETY SHUTOFF: Automatically breaks circuit to shut off elements when door is opened.

NEON PILOT LAMP: Amber indicates element operation.

FIREBRICK INSULATION: Full 7 in. thick with a full +3000°F. service temperature and lower thermal conductivity. Reduces heat loss, lowers KW operating requirements.

EXHAUST SYSTEM: High temperature ceramic tube, 1 in. diameter, to vent fumes and vapors from chamber. Has plug insert for sealing when venting is not required.

WIRING: 120 V. isolated control circuit. All wiring totally enclosed. Furnace ready for connecting to power source. Wiring meets N.E. Code, as amended. Terminal boxes provided with all models.

Model Number	Inside Dimensions Inches (Cm.)			Overall Dimensions Inches (Cm.)			Total KVA	Voltage 50/60 Hz. A.C. Single Phase	Shipping Weight Lbs. (Kg.)	Complete Price With OTP
	W.	D.	H.	W.	D.	H.				
RG-3000C-2	8 (20)	12 (31)	8 (20)	30 (76)	37 (93)	60 (152)	7.5	240 V.	1460 (663)	$4920.00
RG-3000D-2	8 (20)	12 (31)	8 (20)	30 (76)	37 (93)	60 (152)	7.5	480 V.	1460 (663)	4920.00
RG-3005C-2	10 (25)	16 (40)	10 (25)	32 (80)	41 (103)	62 (157)	15	240 V.	1460 (663)	6315.00
RG-3005D-2	10 (25)	16 (40)	10 (25)	32 (80)	41 (103)	62 (157)	15	480 V.	1460 (663)	6315.00

OPTIONAL AND RECOMMENDED ACCESSORIES — SPARE PARTS

Please give unit model no., and voltage when ordering accessories

REPLACEMENT ELEMENTS: Complete set of SGR GLOBARS. For your convenience, we recommend the purchase of an extra matched set of elements with the furnace to be replaced when required. Please contact factory for prices.

RG-3000C & D-2: Part No. EO5C-2 (8/set)
RG-3005C & D-2: Part No. EO5C-3 (10/set)

REPLACEMENT PLATINUM THERMOCOUPLE ASSEMBLY: Complete with protection tube and head. Please contact the factory for price of Part No. C11B-4-3.

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly

BLUE M

Stabil-Glow®

Crucible or Pot

FURNACE

with solid-state control and built-in overtemperature protection

IMPROVED SOLID-STATE CONTROL POTENTIOMETER
Indicating type, provides good control throughout extended range

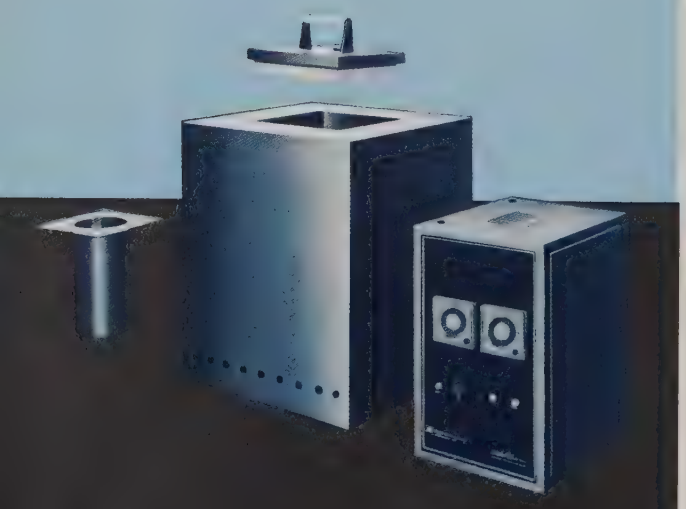
BUILT-IN MAX-SET OVERTEMPERATURE PROTECTION
Solid-state, complements main control for safety of workloads and equipment

TEMPERATURE RANGE
+100°C. to +1010°C. (+1850°F.)

LARGE CAPACITY CRUCIBLE
Inconel Alloy. 6 in. x 12 in. I.D.

MODELLA ELEMENTS
Completely surround crucible for uniformity of temperatures.

REMOVABLE CRUCIBLE COVER
Inconel sheathed inner face



IMPROVED SOLID STATE INSTRUMENTATION AND BUILT-IN OVERTEMPERATURE PROTECTION FOR MAXIMUM SAFETY AND RELIABILITY

A number of significant improvements has made this already superior Blue M Furnace even better than before. Besides improved solid-state instrumentation and built-in overtemperature protection, this fine unit features an Inconel sheathed magnesium oxide thermocouple, with break protection, for maximum sensitivity and long life. A mercury relay—sealed, silent and fast operating—coupled with the unit's advanced solid-state instrumentation provides excellent control and reliability. Top quality construction has been enhanced by the addition of Inconel sheathing on the inner face of the crucible cover.

This furnace is recommended for such applications as tempering, hardening, heat-treating of ferrous and nonferrous metals, glass annealing, and thermocouple calibration. In design, construction and operation it can handle even the most critical applications with ease and dependability.

However, please note the following:

1. The standard Inconel crucible or pot IS NOT SUITABLE FOR MOLTEN ALUMINUM. If your application necessitates melting aluminum, you must order the Cast Iron Alloy Crucible, Part No. M27-A1, described under Recommended Accessories on the next page, and pictured below.
2. While the standard Inconel crucible or pot is suitable for salt bath operations, good housekeeping procedures must be followed. Do not allow sludge to form on the bottom. The pot should be removed and cleaned periodically (depending on usage) to remove sludge and to prolong pot life.

EQUIPMENT COVERED BY OUR EXCLUSIVE
PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM
WARRANTY
SEE PAGE 10

BLUE M

GENERAL SPECIFICATIONS AND PRICES

IMPROVED INSTRUMENTATION

MAIN CONTROLLER: Solid-state indicating temperature control of potentiometric design featuring advanced integrated circuitry and time proportioning. Shock and vibration resistant. Illuminated direct read-out dial with 6" scale provides setting accuracy to within 0.5% of scale. Indication is 10% of span on either side of setpoint. Example: if temperature is set at +300°C. on a controller with a 600°C. span, indicator registers actual chamber temperature at any point between +240°C. and +360°C. Indication accuracy is ±1½% of full scale. Scales in Centigrade standard; Fahrenheit available when specified at time of order.

BUILT-IN OVERTEMPERATURE PROTECTION: Similar solid-state instrument complements main control and conveniently installed adjacent to it. Features exclusive Blue M MAX-SET™ time-delay circuitry and operation as described on page 14. Easily set. Positive protection at all times . . . standard on every unit.

CONSTRUCTION: Heavy gauge steel, angle framing, thick steel top plate painted with high temperature aluminum. All welded; insulation 6 in. Firebrick and Mono-Block. Exterior of furnace and instrument compartment finished in baked-on beige enamel.

REMOTE TYPE CONTROL COMPARTMENT: Steel construction; baked beige enamel finish. Houses switch, fuse, relays, control, etc. May be wall-mounted or set adjacent to furnace. Overall dimensions: 12 in. W. x 16 in. D. x 19 in. H.

DUAL THERMOCOUPLE: #24 gauge MGO-C/A, 12 in. long sheath; has 10 lineal feet corresponding lead wire for portability.

ALLOY CRUCIBLE: Heavy gauge Inconel alloy for best resistance to heat and corrosion. Crucible has flanged top and is removable. **Optional: Cast iron alloy crucible for melting aluminum. See below.**

MERCURY RELAY: Silent and fast operating. No exposed arc, dust and moisture-proof at all times. Hermetically sealed, mercury to mercury, make and break in a hydrogen atmosphere. Double pole type.

MODELLA ELEMENTS: Completely surround alloy pot. Low watt density. Helically coiled; alloy shield/refractory supports full height and circumference of crucible.

CRUCIBLE COVER: Heavy gauge steel with Inconel sheathed inner face. Lifting handle and viewing port with slide included. Cover is removable and has port for insertion of thermocouple or other temperature indication device within the crucible proper.

MAIN SWITCH: Places unit into operation.

WIRING: Complete. Meets N.E. Code, as amended. Terminal box provided. Ready for power hook-up.

Model Number	Inconel Crucible I.D. Inches (Cm.)		Overall Dimensions Inches (Cm.)			Total KVA	Voltage 50/60 Hz. A.C. Single Phase	Shipping Weight Lbs. (Kg.)	Complete Price With OTP
	Dia.	H.	W.	D.	H.				
8006C-2	6 (23)	12 (31)	22 (55)	22 (55)	30 (76)	5.7	240 V.	540 (245)	$1310.00

Furnace will operate reliably when connected to 208 volt service, with control transformer tap change. A 25% reduction in element power will result

OPTIONAL AND RECOMMENDED ACCESSORIES — SPARE PARTS

Please give unit model no., and voltage when ordering accessories

AUTOMATIC PROGRAM TIMER: 24 hour, built-in to control heating periods.
Part No. C12A-1 ..... $65.00

EXTRA INCONEL CRUCIBLE: Same as described above, 6" diameter x 12" high.
Cat. No. CRU-101 ..... $215.00

CAST IRON ALLOY CRUCIBLE: Recommended especially for melting aluminum. Slips inside standard Inconel crucible supplied with unit and is readily removed as needed. 4½" diameter at top tapers to 3½" at bottom, 10½" high. Flanged top.
Part No. M27-A1 ..... $120.00

EXTRA THERMOCOUPLE: Same as described above.
Part No. C11B-3-7 ..... $30.00

EXTRA ELEMENTS: Same as described above.
Cat. No. A121-486 ..... $205.00

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly

BLUE M

Double-Duty

Stabil-Glow®

Combustion

TUBE FURNACES

Single Zone

with solid-state control and built-in overtemperature protection

IMPROVED SOLID-STATE CONTROL POTENTIOMETER
Indicating type, provides good control throughout extended range

BUILT-IN MAX-SET OVERTEMPERATURE PROTECTION
Solid-state, complements main control for safety of workloads and equipment

DOUBLE-DUTY ACCOMMODATE 1¼" AND 2¼" O.D. TUBES
Easily interchanged

CONTINUOUS OPERATION
+66°C. to +1010°C. (+1850°F.)

INTERMITTENT OPERATION
To +1093°C. (+2000°F.)

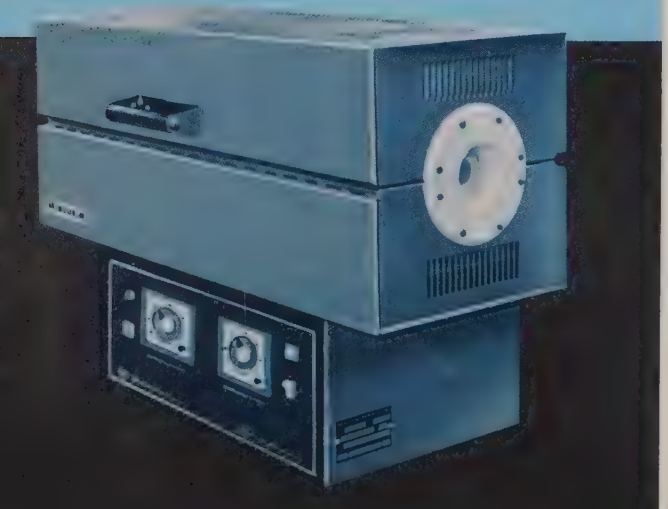
QUALITY TOP OPENING CONSTRUCTION
Provides easy access to interior; speeds tube cooling, shortens test time.

DOUBLE WALL CONSTRUCTION
Ventilated air space between interior and exterior walls maintains exterior temperature less than 200°F. at +2000°F.

MODELLA ELEMENTS:
Completely surround heat tube for fast run-up stability

QUALITY DUAL INSULATION
Mono-Block and insulating firebrick surround heat zone. Areas parallel to elements front and rear are ceramic.

ALL WIRING COMPLETE
Furnace ready to operate; 3-wire cord and plug.



NOW STANDARD ON ALL 3 VERSATILE MODELS . . . IMPROVED INSTRUMENTATION, BUILT-IN OVERTEMPERATURE PROTECTION AND SAFETY SHUT OFF SWITCH

Compact design . . . more efficient construction . . . greater operational convenience . . . attractive new styling have all been combined into these completely re-engineered Blue M Tube Furnaces. The additon of two new sizes also enables laboratories and research departments to select a model that suits their needs exactly. Each model accommodates both 1¼" and 2¼" O.D. tubes.

Advanced features include improved solid-state instrumentation with matching built-in overtemperature protection instrument for the performance and safety you need. All instrumentation is housed in a well ventilated base for maximum operator convenience.

Double wall construction with air convection space between interior and exterior reduces heat loss while keeping exterior surfaces within good furnace design limits. Special 3½" thick dual firebrick/Mono-Block construction surrounds heat chamber.

Top portion of furnace swings open easily on specially designed spring-loaded hinges, and remains open automatically for ready access to the interior. Test samples easily inserted and removed. Also facilitates chamber cooling, shortening test time and allowing more tests to be completed per day. Safety shutoff cuts power to elements when top is opened.

These rugged, quality-built furnaces are suitable for a wide variety of applications including tensile testing and creep tests, ash determinations, strain and stress work, catalytic cracking of petroleum, element analysis in controlled atmosphere, metal reductions and other work requiring reliable temperature stability and uniformity.

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM
WARRANTY BLUE M
SEE PAGE 16

BLUE M

GENERAL SPECIFICATIONS AND PRICES

IMPROVED INSTRUMENTATION

MAIN CONTROLLER: Solid-state indicating temperature control of potentiometric design featuring advanced integrated circuitry and time proportioning. Shock and vibration resistant. Illuminated direct read-out dial with 6" scale provides setting accuracy to within 0.5% of scale. Indication is 10% of span on either side of setpoint. Example: if temperature is set at +300°C. on a controller with a 600°C. span, indicator registers actual chamber temperature at any point between +240°C. and +360°C. Indication accuracy is ±1½% of full scale. Scales in Centrigrade standard: Fahrenheit available when specified at time of order.

BUILT-IN OVERTEMPERATURE PROTECTION: Similar solid-state instrument complements main control and conveniently installed adjacent to it. Features exclusive Blue M MAX-SET™ time-delay circuitry and operation as described on page 14. Easily set. Positive protection at all times . . . standard on all units.

CONSTRUCTION: Double wall all welded heavy gauge steel exterior structurally reinforced as required for optimum service and long life. Carefully placed air vents ventilate instrument compartment and surfaces. Attractive beige baked-on enamel finish. Removable solid black enamel control panel provides complementary finish.

DUAL INSULATION: Mono-Block plus high temperature firebrick completely surrounds heat chamber. Air spaces between interior and exterior walls serve to minimize heat loss and to keep exterior surface temperature within good furnace design.

MODELLA HEATING ELEMENTS: Completely surround heat zone. Non-oxidizing, non-flaking and practically impervious to attack from sulphur and its compounds. Can withstand +1314°C. temperature. Modella elements are far superior to the type of elements ordinarily used in furnaces of this temperature range.

ELEMENT PLATES: Ribbed, extra thick—designed especially for these units—grooved to support Modella elements along entire length. Surround circular heat zone. Are replaceable since they can be removed through the end openings.

HARDWARE: Top portion of furnace swings open on heavy-duty spring-loaded hinges. Top automatically held open for convenient viewing or tube changing. Sturdy Bakelite handle.

SAFETY SHUTOFF: Automatically breaks circuit to shut off elements when top is opened.

ON-OFF SWITCH: Ample capacity to place unit into immediate operation.

NEON PILOT LAMP: Red, denotes unit is in operation.

WIRING: Stainless steel terminals are placed outside the heating zone to eliminate corrosion and to facilitate servicing. Range wire used for electrical wiring. Ready for instant use. Complete according to N.E. Code, as amended. 3-wire line cord and plug.

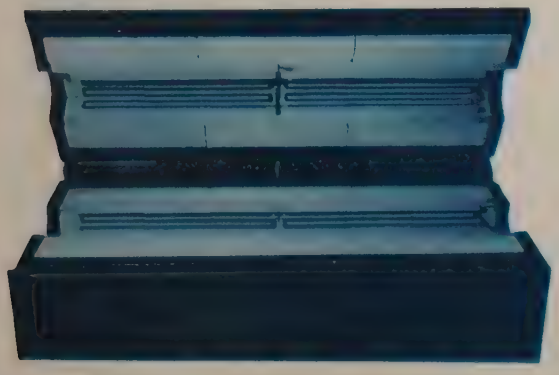
Model Number	Heat Zone		Overall Dimensions Inches (Cm.)			Total VA	**Voltage 60 Hz. A.C. Single Phase	Shipping Weight Lbs. (Kg.)	Complete Price With OTP
	*Maximum Tube O.D. Inches (Cm.)	Chamber Length Inches (Cm.)	W.	D.	H.				
TF-1220C-4	2¼ (6)	12 (31)	20 (51)	17 (43)	20½ (52)	1500	240 V.	150 (68)	$1370.00
TF-1820C-4	2¼ (6)	18 (45)	23½ (59)	17 (43)	20½ (52)	2200	240 V.	175 (79)	1395.00
TF-2420C-4	2¼ (6)	24 (61)	30 (76)	17 (43)	20½ (52)	2900	240 V.	225 (102)	1585.00

*All models come supplied with special adaptor rings which permits use of standard 1¼" O.D. tubes in addition to 2¼" O.D. size. Various types of combustion tubes and combustion boats are available from your laboratory dealer

**All models will operate reliably when connected to 208 volt service, with control transformer tap change. A 25% reduction in element power will result

OPTIONAL AND RECOMMENDED ACCESSORIES — SPARE PARTS

Please give unit model no., and voltage when ordering accessories



EXTRA THERMOCOUPLE: Part No. C11B-3-9 . . . **$8.00** Each

SPARE OR REPLACEMENT HEATING ELEMENTS: Please contact factory for price. When ordering, please include model number and serial number affixed to your unit. Illustration shows set of elements installed in a typical furnace.

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly

BLUE M

Lab-Heat

DENTAL MUFFLE FURNACES

TEMPERATURE RANGE
+100°C. to +871°C. (+1600°F.)

HEAVY STEEL CONSTRUCTION

QUALITY REFRACTORIES THROUGHOUT
Low coefficient of expansion

COUNTERWEIGHTED DOOR

PYROMETER AND THERMOCOUPLE

NICKEL-CHROMIUM HEATING ELEMENTS

STAINLESS STEEL LOAD TRAY OR QUALITY REFRACTORY OPTIONAL

AUTOMATIC TRIGGER CONTROL
U.L. Listed; Adjustable 3% to 99% plus 100% OFF; Control operates on current input basis and interrupts current in accordance with knob position.

ALL WIRING COMPLETE
U.L. Listed—Ready to operate
Line cord and plug supplied

DESIGNED FOR DENTAL LABORATORIES SPECIFICALLY FOR WAX BURN-OUT AND EXPANSION OF CASTING RINGS

These quality Blue M Furnaces have been designed and built especially for dental laboratory use or for service in dental colleges. The practicing professional dentist and the dental student alike will find them ideal for such work as wax burn-out and expansion of casting rings. Yet despite their low cost, these units offer a number of advanced features—described in detail on the opposite page—which assure years of dependable service with minimum attention. Each furnace is individually inspected and tested in accordance with Underwriters' Laboratories instructions.

Despite the fact that this furnace is very competitively priced, it incorporates engineering concepts which Blue M has developed and proven in decades of furnace design and manufacturing experience. This invaluable expertise cannot be obtained from any competitive unit, regardless of price.

This furnace is one of several chambers Blue M has developed for special-purpose applications. Others include our Stabil-Glow Crucible or Pot Furnaces and Stabil-Glow Tube Furnaces. These are pictured and described on earlier pages.

UL®
Guide No. 165E9
File No. E30112

EQUIPMENT COVERED BY OUR EXCLUSIVE PARTS WARRANTY and REPLACEMENT SERVICE PROGRAM

WARRANTY BLUE M SEE PAGE 10

BLUE M

GENERAL SPECIFICATIONS AND PRICES

CONSTRUCTION: Made entirely of heavy gauge steel; welded and reinforced. Furnace front plate constructed of ¼ in thick steel. Furnace and door finished with a hammerloid beige baked-on enamel. Structural steel door face plate finished in high temperature aluminum. Base is well ventilated, and small aperture at top center allows removal of fumes and gases. Modern design—self-contained—solidly built.

INSULATION: Extra heavy, 2½ in. thick blocks of high temperature firebrick on all six sides including door.

THERMOCOUPLE: Chromel/Alumel #14 gauge beaded thermocouple and lead wire.

LARGE INDICATING PYROMETER: Millivoltmeter type—has dual scale: 0° to +1100°C./0°F. to +2000°F. 3½ in. scale length, 20°F. graduations. Zero adjustment. Carefully factory calibrated at two temperatures before shipment.

AUTOMATIC TRIGGER CONTROL: Keeps any temperature within unit range uniform. Saves power—prevents burnouts. Activated by low wattage, synchronous motor device which interrupts line current through a fixed cycle.

HEATING ELEMENTS: Modella elements embedded in refractory, all four sides.

REMOVABLE LOAD TRAYS: 18-8 stainless standard. Optional removable Hi-Heat refractory tray. See below.

DOOR: Counterweighted and hinged at bottom to open downward and expose full furnace interior. Firebrick insulated. Steel counterweight has black enamel finish.

WIRING: Furnace is ready to operate. Comes complete with 6 foot cord, plug and strain relief. Each furnace tested at 1000 V. for one minute at maximum temperature. U.L. Listed.

Model Number	Inside Dimensions Inches (Cm.)			Overall Dimensions Inches (Cm.)			Maximum Watts	*Voltage 60 Hz. A.C. Single Phase	Shipping Weight Lbs. (Kg.)	Complete Price
	W.	D.	H.	W.	D.	H.				
600A	9 (23)	4½ (11)	4 (10)	17 (43)	12 (31)	18 (45)	1500	120 V.	50 (22)	$290.00

*Units available for 240 V. or 208 V./1 Ph. We will supply a separate autoformer package complete with line cord and plug. Simple installation.
Specify Part No E17E-1-2.....$120.00 Each

OPTIONAL AND RECOMMENDED ACCESSORIES—SPARE PARTS

Please give unit model no., and voltage when ordering accessories.

EXTRA THERMOCOUPLE
Part No. C11B-3-8 ..... $7.50 Each

EXTRA STAINLESS STEEL TRAY
Part No. M20-B1 ..... $12.00 Each

EXTRA HEATING ELEMENT AND REFRACTORY ASSEMBLY
Part No. E05E-1 ..... $86.00 Each

REMOVABLE REFRACTORY LOAD TRAY. Molded of HI-HEAT refractory and ribbed 4⅜" x 8¾" x 1" thick.
Cat. No. LT-112 ..... $10.00 Each

EXTRA INDICATING PYROMETER ONLY
Part No. CO1D-5 ..... $36.00 Each

Shipping weights shown are for standard models. Units ordered with accessories may require special packing, increasing shipping weight slightly.

BLUE M
RECOMMENDED ACCESSORIES

Supplementary or Replacement Aids Carried in Stock for Your Convenience

THESE QUALITY CONTROLLERS

- [illegible]
- [illegible]
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- [illegible]

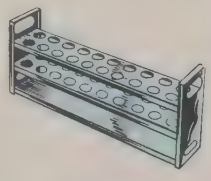
ALL UNITS [illegible]
GUARANTEED [illegible]
MATERIALS AND WORKMANSHIP

Factory installation of accessories listed on the following pages permits maximum utility, convenience and efficiency from laboratory, pilot plant and production equipment. We also suggest purchase of spare parts with the basic equipment for replacement to minimize shut downs.

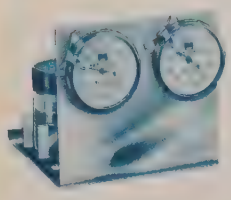
Many of these aids extend the scope or add a new dimension to the usual function of baths, ovens, furnaces, etc. The diversified components available will help perform every supplementary operation possible for temperature control equipment.

Each item has been carefully selected to provide the ultimate in service, quality, and reliability to meet your most exacting standards or requirements. The fact that these accessories are the same as supplied with some of our products as standard and are manufactured by Blue M Electric Company or other well known organizations is your assurance of their superiority and dependability.

Oven Accessories
Pages 164-166



Bath Accessories
Pages 167-168



Environmental Accessories
Page 169

Miscellaneous Accessories
Pages 170-171

NEW BLUE M *Max-Set*™

PROBABLY THE MOST SOPHISTICATED PROTECTIVE INSTRUMENT EVER DEVELOPED

Exclusive Blue M design—providing positive protection of valuable workloads and equipment—offers features, operational efficiency, and simplicity never before available in such low-cost instrumentation.

MAX-SET eliminates nuisance tripping. If OTP should be activated due to a significant line voltage surge or sudden shock, for example, an alarm sounds to alert the operator. This alarm stops once conditions return to normal, the OTP resets automatically, and the chamber continues to operate.

However, should a true overtemperature condition arise—due to component failure, combustion within the chamber, etc.—the alarm will sound as MAX-SET shuts down the chamber. As conditions with the chamber reach a temperature below OTP set point, the alarm stops and the chamber is once again activated. If the problem has not been solved, temperature will rise and trip the OTP. Again the alarm will sound and MAX-SET will shut down the unit. This cycle repeats several times until MAX-SET automatically shuts down the chamber and silences the alarm permanently. A red light then signals the operator that the chamber is in a true failed condition and that remedial steps must be taken. After the cause of the failure has been determined and corrected, MAX-SET must be re-activated by means of a manual switch.

MAX-SET features full scale setability—can be set to operate at any temperature within the chamber's range. And OTP set point is easily established and quickly located—permitting overtemperature setting to be established very close to desired operating temperature and minimizing the chance of operator error.

PARAGON AUTOMATIC TIMER

24 Hour or 7 Day

Quick change, easy-add dial tripper. No need to remove dial.

Spring clutch dial drive.

Synchronous motor operating indicator.

U.L. Listed switch.

Capacity at 120 V., 40 amperes.

NOTE: 24-hour timers are equipped with a "skip-a-day" feature. Used where on-off operations are the same for each day of the week, but weekends or any other day or days are to be eliminated

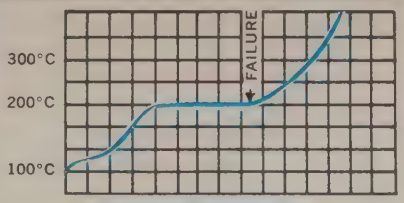
Part Number	Time Cycle	Voltage 60 Hz. A.C.	Switch	Price Each	Price Installed
C12A-1	24 hour	120 V.	SPDT	$42.00	$65.00
*C12A-3	7 days	120 V.	4 Action	62.00	85.00

*SPST, DPST, SPDT, DPDT—4 Action—2 Normally Open and 2 Normally Closed

BLUE M

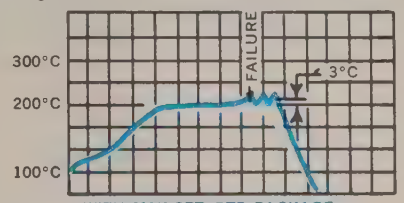
OVERTEMPERATURE PROTECTION PACKAGE

- **TIME DELAY CIRCUIT PREVENTS "NUISANCE TRIPPING"**
  Maintains trip setting within 5°C. or less above control setting. Held in mechanically, does not drop out on power failure.
- **LOAD ALARM BUZZER**
  Has built-in, normally closed contacts.
- **PILOT LIGHT INDICATES CONTROL FAILURE**
  A glance is all the operator needs.
- **PUSHBUTTON RESET**
  Easily accessible on front panel.
- **JUMPER TERMINALS**
  Makes proper voltage selection easy.
- **LOAD CONTACTOR AND CONTROL CIRCUIT TRANSFORMER ENCLOSED IN HOUSING**
  Compact design affording maximum protection against dirt and other contaminants.
- **CONTROL PANEL ROTATABLE**
  Can be rotated 90° or 180° for job-matched mounting.
- **TYPE 316 STAINLESS STEEL THERMAL BULB AND CAPILLARY**
  Assures fast, accurate response . . . maximum service life.
- **WIRING COMPLETE**
- **PATENTED MEMORY RING® TEMPERATURE CALIBRATING DIAL AND DIAL POINTER LOCK**



WITHOUT MAX-SET OTP

Failure of control or other components results in temperature increase and resultant loss in workload and equipment. May be avoided by installing Blue M MAX-SET OTP Package



WITH MAX-SET OTP PACKAGE

Primary + Secondary

Complete protection for equipment and also workload. Power off, alarm sounds. Cycle repeats several times until MAX-SET shuts down chamber and silences alarm permanently. Red light on.

4 TEMPERATURE RANGES

Dials graduated in degrees Centigrade or Fahrenheit. (Please specify choice.)

Complete Price, All Ranges . . . . . **$200.00** Each

MAX-SET may be used directly on any POWER-O-MATIC 60® controlled unit rated at 50 amps/phase or less, single or three phase, as well as other equipment with proper temperature ranges and these electrical characteristics. Please contact the factory for information on use with equipment rated at over 50 amps/phase.

Instrumentation is enclosed in a 9" W. x 6½" D. x 9" H. steel housing with an attractive baked-on black enamel finish. Control panel is anodized aluminum with various controls clearly identified for easy operation. MAX-SET comes complete, including pre-drilled mounting brackets, ready for simple installation.

COMPLETE INSTRUMENT READY FOR INSTALLATION ON EXISTING UNITS Catalog Number	SCALE RANGES Degrees Centigrade or Fahrenheit	STAINLESS STEEL SENSING BULB LENGTH (Capillaries all 71" Long)	ELECTRICAL CHARACTERISTICS
OTP-1305C-2	-73°C. to +204°C.	3 Feet, 9½ Inches	ELECTRICAL: 120 V., 240 V. or 480 V. Single or Three Phase 60 Hz. A.C. CONTACTOR RATING: 50 Ampere/Phase 3 Pole (Contactor supplied with 120 V. Coil) CONTROL CIRCUIT: 120 Volts
OTP-1305F-2	-100°F. to +400°F.		
OTP-1163C-2	-29°C. to +104°C.	9 Feet, 2 Inches	
OTP-1163F-2	-20°F. to +220°F.		
OTP-1164C-2	-18°C. to +204°C.	4 Feet, 8⅝ Inches	
OTP-1164F-2	-0°F. to +400°F.		
OTP-1165C-2	+50°C. to +343°C.	5 Feet, 2 Inches	
OTP-1165F-2	+120°F. to +650°F.		

*For use in 120 V. control circuits only. Shipping weight: 16 lbs

AUTOMATIC SHUT-OFF TIMERS

Spring Wound Manual Timers to Control Heating Periods

The Automatic Shut-Off Timer listed as an accessory on various Oven pages in this catalog is included here to show its appearance. When ordered installed at the factory, this instrument has the round black dial which complements the rest of the unit as shown to the right, top. When ordered for an existing unit, the timer has the rectangular face shown below. The internal mechanism and function of both types is the same. Timers with the round dial are also available for existing units, but must be clearly specified.

These timers are suitable for POWER-O-MATIC 60 Industrial Batch Ovens or other units rated at 2.4 K.W. or less. On larger units they will shut off heat only, and require an auxiliary contactor for proper operation. Please contact factory for information and prices.

FACTORY-INSTALLED TIMERS

Part Number	Time Cycle	Price Each	Price Installed
C12D-3	0 to 6 Hours	$24.00	$35.00
C12D-5	0 to 12 Hours	28.00	38.00

TIMERS FOR EXISTING OVENS

Part Number	Time Cycle	Price Ready To Install
C12D-2	0 to 6 Hours	$18.00
C12D-4	0 to 12 Hours	22.00

ALL BY BLUE M

LOW TEMP INDICATING PYROMETER

DUAL SCALE

Range 0°F to +650°F
0°C to +343°C

Graduations 5°F
Scale length 3½"

Indication Accuracy: ±2%

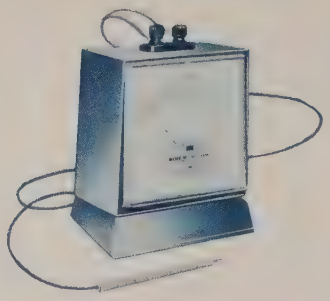
STAINLESS STEEL CASE WITH BLACK ENAMEL DIE CAST BASE

A valuable instrument for every laboratory. Permits instant temperature readings for ovens, incubators, heating mantles, hot plates, etc.

Pyrometer consists of D'Arsonval moving coil design, polished jewels and pivots, fatigue tested springs and stress relieved assembled unit. Movement encased in sturdy plastic housing. Has (2) binding posts mounted at top of case. Has zero adjustment. Comes complete with 15 feet No. 20 ga. I/C duplex thermocouple and lead wire.

OVERALL DIMENSIONS: 7" H. x 6" W. x 6" L.

Cat. No. APL-500 Complete . . . . . **$79.00** Ea.
Part No. C11B-1-2 Extra Thermocouple . . **16.00** Ea.



HI TEMP INDICATING PYROMETER

DUAL SCALE

Range 0°F. to +2000°F.
0°C. to +1100°C.

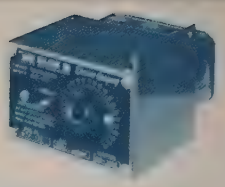
Graduations: 20°F
Scale length: 3½"

Indication Accuracy: ±2%

STAINLESS STEEL CASE WITH BLACK ENAMEL DIE CAST BASE

Basically similar in construction to Catalog No. APL-500 described at left but has stainless steel case and wider range for furnaces and other elevated temperature units. Complete with No. 14 gauge Chromel Alumel Thermocouple ¼" Dia. and 48" long, protected with ceramic beads, 3 lineal feet of duplex C/A lead wire.

Cat. No. APH-500 Complete . . . . . **$84.00** Ea.
Part No. C11B-3-5 Extra Thermocouple . . **17.50** Ea.



OVERTEMPERATURE PROTECTION with MAX-SET™ CIRCUITRY

- **EXCLUSIVE TIME-DELAY FEATURE—ELIMINATES NUISANCE TRIPPING**
- **VERSATILE +38°C. TO +288°C. (+100°F. TO +550°F.) RANGE**
- **47" COPPER CAPILLARY AND SENSING BULB**

A budget type safety unit recommended for ovens, baths, and similar equipment having the required electrical capacity and temperature range. Instrument has enameled steel enclosure, U.L. Listed switch and reset push button.

Quickly and easily installed on right, left, or top of unit. Completely self-contained. Junction box on back. When ordered with equipment, factory installation is made at no charge.

For 120V., 50/60Hz. A.C. operation (instrument has 20 amp current capacity):

Specify Part No. CO8A-7-5 . . . . . **$125.00** Each

For 240., 50/60Hz. A.C. operation (instrument has 15 amp current capacity):

Specify Part No. CO8A-7-6 . . . . . **$125.00** Each

PARTLOW SINGLE PEN RFT Recording and Indicating Thermometers

To keep a permanent record of process temperature; allows critical analysis of results at future time.

INSTRUMENT PRICE (NOT INSTALLED) . . . . . **$340.00** Each **(ALL RANGES)**

FACTORY INSTALLATION . . . . . **$45.00** Each **(ALL RANGES)**

Part Number	Temperature Range	Scale Division	Electric Chart Drive Rotation	*Additional Charts 10" Dia. 100 Per Box
CO2A-2-3	+100°F. to +450°F. +40°C. to +230°C.	5°F 2°C.	1 Day 1 Day	C10A-2-5 C10A-2-7
CO2A-2-4	+100°F. to +450°F. +40°C. to +230°C.	5°F. 2°C.	7 Day 7 Day	C10A-2-6 C10A-2-8
CO2A-2-5	+100°F. to +650°F. +40°C. to +340°C.	5°F. 5°C.	1 Day 1 Day	C10A-2-9 C10A-2-11
CO2A-2-6	+100°F. to +650°F. +40°C. to +340°C.	5°F. 5°C.	7 Day 7 Day	C10A-2-10 C10A-2-12
CO2A-2-7	+100°F. to +1100°F. +40°C. to +600°C.	10°F. 5°C.	1 Day 1 Day	C10A-2-13 C10A-2-15
CO2A-2-8	+100°F. to +1100°F. +40°C. to +600°C.	10°F. 5°C	7 Day 7 Day	C10A-2-14 C10A-2-16

*Additional Charts . **$9.00/Box**

Specifications Applicable to All Units Shown

CASE SIZE OVERALL: 15⅛" W. x 13¼" H. x 4-11/16" D
PANEL CUTOUT FOR FLUSH MOUNTING: 13½" W. x 12⅜" H.
CAPILLARY LENGTH (ALL UNITS): 5 Feet
STAINLESS SENSING BULB DIAMETER (ALL UNITS): 3/16"
STAINLESS SENSING BULB LENGTHS:
All Units with +100°F.—+450°F./+40°C.—+230°C. range: 44"
All Units with +100°F.—+650°F./+40°C.—+340°C. range: 28"
All Units with +100°F.—+1100°F./+40°C.—+600°C. range: 16"

ACCURACY: ±1%
NET WEIGHT: 13 lbs.
SHIPPING WEIGHT: 20 lbs.

Mercury filled thermal elements . . . Die cast aluminum case
Electric chart drives: 24-hour or 7-day . . . 10" diameter charts: 100 supplied . . . Snap-action switches . . . Precision calibrations.

NOTE: WHEN ORDERING ANY INSTRUMENT, BE SURE TO SPECIFY FAHRENHEIT OR CENTIGRADE SCALE.

All instruments supplied for 120 V./60 Hz. A.C. For 240 V. or 480 V. operation an instrument transformer is required. Order as follows:

For 240 V., Part No. E17A-2-1 . . . . . **$14.00** Each
For 480 V., Part No. E17B-2-11 . . . . . **$18.00** Each

BLUE M

ACCESSORIES for Magni Whirl® BATHS

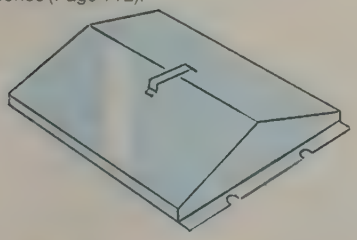
PATENTED IN U.S.A. AND CANADA

These accessories and spare parts are designed to insure optimum bath efficiency and performance and are those most commonly required. THEY ARE LISTED AND PRICED ON THE PAGES INDICATED IN THIS CATALOG. The brief description of them here will help you evaluate them and equate them to your specific needs.

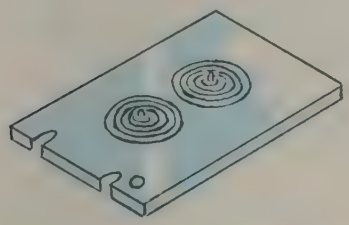
Some of the accessories on the following pages are not listed on the individual unit pages in this catalog, but are nevertheless recommended whenever the function they perform is desired. Specific bath series number and catalog page reference are given for each item.

PLEASE SPECIFY CATALOG PART NUMBER, MODEL NUMBER AND SERIAL NUMBER WHEN ORDERING ANY ACCESSORY.

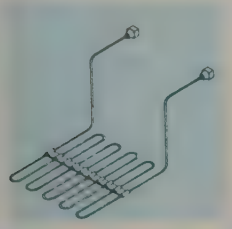
REFERENCE:
Blue M Magni-Whirl MWR-1120 Series (Page 94); MW-1110 Series (Page 96); MW-1120C-1HP Series (Page 98); MW-1210 Series (Page 100); and MR-3210 Series (Page 112).



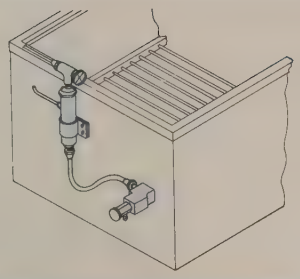
REMOVABLE SOLID GABLE COVER WITH HANDLE: Prevent evaporation or dripping of condensed water into culture tubes. Removable. Polished stainless, type 304.



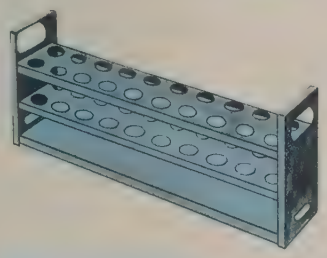
CONCENTRIC RING COVERS: Offer advantages of gable covers, plus accommodation for various size flasks. Cover polished stainless; ring sets of copper, electro-tinned. Largest opening 4⅛" dia. on all except 5⅛" on largest model in each series. Diameters of three smaller opening in all, ¾", 1⅜" and 2⅛".



NICKEL-PLATED COPPER COOLING COIL: To obtain temperatures below ambient, circulate cold water, etc. Seamless copper tubing. Bracket and compression coupling included.
NOTE: Not required on MR-3210 Series



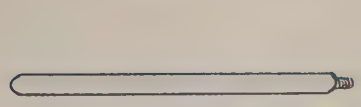
CONSTANT WATER LEVER FEEDER: Automatically maintains liquid at desired level. Ideal when baths are operated unattended over extended periods, particularly at higher temperatures without covers. Easily cleaned and maintained.
NOTE: When ordered separately for installation on existing bath, specify: Cat. No. JA-0-01..... $60.00 Each



TEST TUBE RACKS: For all clinical/medical tests. All polished stainless. ARMY-MEDICAL TYPE—20 tube capacity. Hold 4" x ½" tubes in 2 rows of holes numbered 1 to 10. Size of racks: 10"L. x 2 1/16" W. x 5 7/16" H.

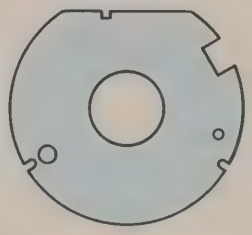
REFERENCE:
Blue M. Magni-Whirl Jar Baths; MW-1152SSA-1 Series (Page 104) and MR-3262A-1 (Page 114).

CIRCULAR WIRE SHELF: Type 303, 18-8 wire, spot welded and electro-polished. Overall diameters are about 2 in. smaller than jar. Suspended into bath by adjustable stainless jack chains and hooks.

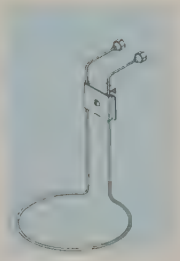


HORIZONTAL EXTENSION RODS: Stainless, type 303, 18-8; ½" dia. x 8½" long. Assemble into hexagonal fittings at top of each hold down rod.

VERTICAL EXTENSION ARMS AND FITTINGS: Adjustable stainless, type 303, 18-8, ½" dia. x 8½" long. Fit extension rods above.



CIRCULAR SOLID COVER: Stainless, type 304, 18-8. Electro-tinned copper concentric ring set in center held by hexagonal fittings of hold down rods. (Largest opening: 5⅛" dia.) Minimizes evaporation.



COOLING COIL: Seamless copper tubing with stainless bracket and flare fittings. Bright nickel-plated. To obtain temperatures below ambient; circulate cold water, etc

NOTE: Not required on MR-3262 Series

ACCESSORIES

*UCON HEAT TRANSFER FLUIDS

FOR MAXIMUM EFFICIENCY FROM YOUR

BLUE M Constant HIGH Temperature UTILITY OIL BATHS (See Pages 108/109)

* Registered Trade-Mark U.C.C. Co.

2 DISTINCT TYPES

+163°C. FLASH POINT (HTF-101) FOR MODELS	MW-1115A-1 MW-1125C-1 MW-1135C-1	+260°C. FLASH POINT (HTF-100) FOR MODELS	MW-1145A-1 MW-1155C-1 MW-1165C-1

- SOLUBLE IN COLD WATER (HIGH TEMPERATURE ONLY)
- RESISTANT TO SLUDGING AND COKING

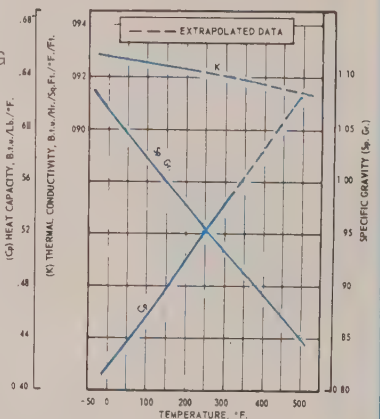
UCON fluids may be described chemically as the ether of a polyaklylene oxide (polyglycol) that contains an aromatic amine as an antioxidant. The polyglycol contains no chlorine, phosphorus or aromatic constituents. UCON fluids exhibit a very low order of toxicity. In tests of oral intake, skin irritation, skin absorption, eye irritation and inhalation, these fluids are quite bland. However, as with all organic materials, adequate ventilation is recommended and should be provided whenever the fluids come in contact with air at elevated temperatures. They differ in chemical nature and in performance from natural oils and from other synthetic heat-transfer liquids. Some of their characteristics, which result in excellent and economical performance, are summarized as follows:

1. Unusually low toxicity.
2. Safe to handle.
3. Electric immersion heaters and other heat transfer surfaces stay clean; give long, continuous operation at high efficiency.

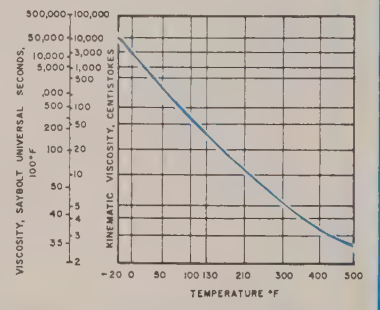
Two types—for specific bath and flash point ranges.

Cat. No. HTF-100, +260°C. flash point, +316°C. fire point. Use for MW-1145, 1155 and 1165 Series.

Cat. No. HTF-101, +163°C. flash point, +190°C. fire point. Use for MW-1115, 1125 and 1135 Series.



Physical properties of UCON heat transfer fluid HTF-100.



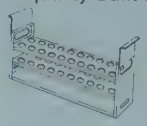
Viscosity vs. temperature for UCON fluid HTF-100.

PHYSICAL PROPERTIES	HIGH TEMPERATURE No. HTF-100		LOW TEMPERATURE No. HTF-101	
Viscosity	S.U.S.	Centistokes	S.U.S.	Centistokes
210°F.	64.6	11.5	36.1	2.95
100°F.	280.0	60.6	70.0	13.10
77°F.	490.0	100.0	85.0	18.0
Viscosity Index	150		78	
Flash Point (Open Cup), °C.	260°C.		163°C.	
Fire Point (Open Cut), °C.	316°C.		190°C.	
Coefficient of Expansion, per 0°F. (+68°F.)	0.00042		0.00045	
Density, lb./gal., +60°F.	8.69		8.0	
Complete Price (in 5 gallon cans)	**$53.00**/5 gal. can		**$53.00**/5 gal. can	

SHAKER BATHS

MSB-1122A-1 SERIES (Pages 102/103)

Designed specifically to help you obtain optimum efficiency from your Blue M Shaker Bath . . . quality-built for years of service.



TEST TUBE RACKS

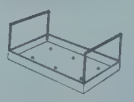
All polished stainless steel, with sure grip design to simplify loading and unloading. 10" L. x 2 1/16" W. x 5 7/16" H. Small baths hold six, large model holds twelve. Two types:

Part No. M20-D2: Holds eight 25 mm. or 1" dia. test tubes . . . . . **$13.00** Each
Lots of six . . . . . **$11.50** Each

Part No. M20-D4: Illustrated, holds twenty 4" x ½" (12 mm.) tubes in two rows . . **$13.00** Each
Lots of six . . . . . **$11.50** Each

TEST TUBE RACK TRAY

Required for Model MSB-1140C-1 when bath is used with Test Tube Racks. Holds 12 each of either Racks M20-D4 or M20-D2 above. Sturdy, all welded polished stainless, with handles.
Part No. M20-B6 . . . . . **$108.00** Each



FLASK TRAYS*

All polished stainless steel with sturdy handles. Three different types:

Part No. M20-B2: Holds twenty 25 ml. or twelve 50 ml. flasks. 6¾" L. x 9½" W. Small baths hold two . . . . . **$28.00** Each
Part No. M20-B3: Holds seven 125 ml. or five 250 ml. flasks. 6¾" L. x 9½" W. Small baths hold two . . . . . **$28.00** Each
Part No. M20-B4: Holds six 500 ml. or three 1000 ml. flasks. 15½" L. x 9½" W. Small baths hold one . . . . . **$36.00** Each

FLASK HOLDERS

Designed for use with Flask Trays above. Made of nickel-plated phosphor bronze. Spring clip design grips flasks firmly to prevent damage and noise.

Part No. M20-C1: for 10 ml. flask . . **$5.75** Ea.
Part No. M20-C2: for 25 ml. flask . . **$5.75** Ea.
Part No. M20-C3: for 50 ml. flask . . **$6.00** Ea.
Part No. M20-C4: for 125 ml. flask . . **$6.50** Ea.
Part No. M20-C5: for 250 ml. flask . . **$6.75** Ea.
Part No. M20-C6: for 500 ml. flask . . **$6.75** Ea.
Part No. M20-C7: for 1000 ml. flask . . **$7.00** Ea.

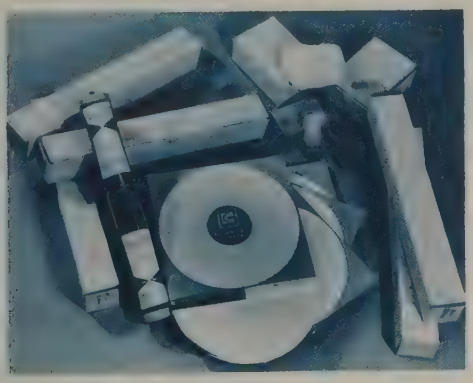
*Model MSB-1140C-1 comes complete with two specially designed stainless Flask Holder Trays which accommodate all the above Flask Holders as follows: (200) M20-C1; (112) M20-C2; (104) M20-C3; (50) M20-C4; (36) M20-C5; (28) M20-C6; (18) M20-C7. To order additional Trays, Specify Part No. M20-B5 . . . . **$49.00** Ea.

NEW

Humid-Pac

ACCESSORY KIT FOR TEMPERATURE/HUMIDITY CABINETS

(AC-7402HA-1 Series, Pages 128/129 and Model POM-7570C-1, Pages 130/131)



- **Eliminates unnecessary down-time**
- **Avoids wasting time, effort, money**
- **Helps assure maximum chamber utilization**
- **Suitable for new and existing equipment**

Everything you need to keep your chamber operating for approximately one year under normal use. Avoids bothersome ordering of individual items, and downtime due to lack of necessary supplies. Includes three dozen recorder wicks and one set of recorder pens, red and green recorder ink, six demineralizing cartridges, water level float, and four boxes of recorder charts, 100 charts per box. (Kind of charts must be specified. See below.) Recommended for purchase with chamber as a supplement to the approximate 30-day supply of accessories furnished with unit, as well as periodically after chamber is placed in service.

Complete as described (Please order by number below) ..... $340.00 Each

Humid-Pac Accessory Kit, Complete As Described With Charts Shown Below			
°C — 24 Hr.	°F. — 24 Hr.	°C. — 7 Day	°F. — 7 Day
Part No. KT-101	Part No. KT-102	Part No. KT-103	Part No. KT-104

BLUE M

HUMIDITY INDICATORS (HYGROMETERS)

Glass Thermometer Type Wide Scale Range

Stainless bracket supports (2) etched stem matched thermometers. Glass water reservoir, plastic cap, wick, and relative humidity conversion chart.

Part No. CO1C-12—With (2) 0°F. to +220°F. Thermometers, 5½" long, 2°F. graduations, red fill. ..... $24.00 Each

Part No. CO1C-11—With (2) -10°C. to +110°C. Thermometers, 5½" long, 1°C. graduations, red fill. ..... $24.00 Each

Especially designed for laboratory and industrial usage

With WIDER Dry Bulb Range

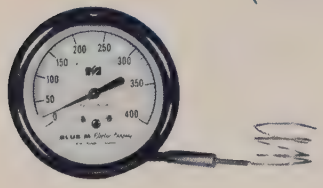
Maximum accuracy from hygrometer subject to minimum 5 FPM velocity.

-10°C. to +110°C. More Versatile . . . Longer Life

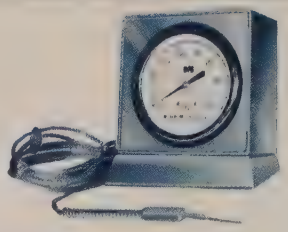
Stand 18-8 stainless for maximum resistance to corrosion. Ventilated for forced air circulation, portable or may be fastened permanently. Equipped with (2) stainless encased dial type thermometers. -10°C. to +110°C. scale range, 1°C. divisions, removable water reservoir, wick and conversion chart. Accuracy is ±2% relative humidity. Size 4" W. x 4" D. x 3½" H.

Part No. CO1E-20 (°C.) $80.00

READY-READ Temperature Indicator (Dual Scale)



READY-READ INDICATOR ONLY
(For Panel Mounting)
PRICE EACH—All Ranges $79.00
Installed Price—All Ranges... $112.00



READY-READ INDICATOR & STAINLESS CASE*
(For Unit Mounting and calibration by user.) Complete with 6" aluminum tube and diastat clips.
*5½" W. x 5½" H. x 3" D. All polished 430 stainless.
PRICE EACH—All Ranges $95.00
NOTE: WHEN ORDERED FOR INSTALLATION AND CALIBRATION AT FACTORY,
Price Ea—All Ranges . $120.00

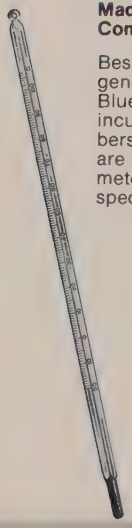
Eliminates the irritation and expense of broken glass thermometers . . . more accurate than small dial thermometers . . . more convenient than pyrometers with thermocouples—and easier to read than any of them! Designed to Blue M's rigid specifications. Accuracy: ±2%.

Large 3½" dial easily mounted on panel or on top of unit for maximum visibility, makes unit operation simpler, safer, surer. Filled system eliminates gears and springs—assures life-time of accurate performance. Bimetal compensation for ambient temperature changes, zero adjustment screw for simple calibration, 6' copper capillary, and 24" type 316 stainless sensing bulb for reliability.

Part Number	Part Number	Temperature Range (Dual Scale)	
		Centigrade Scale	Fahrenheit Scale
CO1A-1	CO1A-11	-30°C. to +105°C.	-20°F. to +220°F.
CO1A-3	CO1A-12	-20°C to +230°C.	0°F. to +450°F.
CO1A-5	CO1A-13	0°C. to +400°C.	+30°F. to +750°F.

ETCHED STEM

Glass Thermometers



Made to rigid Blue M Electric Company specifications

Best quality and grade. For general laboratory usage and Blue M ovens, water baths, incubators, humidity chambers, sterilizers, etc. All are 6-7 mm. outside diameter. Individually packed in special carton.

Part Number	Scale Range	Complete Specifications	Price Each
CO1C-9	+155°C. to +170°C.	Loss on Heat, 6½" long, total immersion, marked at 155°, 160°, 163° and 170°C., ½°C. graduations. Mercury fill.	$21.00
CO1C-5	0°C. to +300°C.	2°C. graduations, 16" long, 2" immersion, white background, mercury fill.	13.00
CO1C-3	0°C. to +260°C.	2°C. graduations, 12" long, 2" immersion, white background, mercury fill.	10.00
CO1C-7	0°C. to +70°C.	½°C. graduations, 12" long, 3" immersion, red mark at 37° and 56°C., mercury fill. White background	10.00
CO1C-2	-2°C. to +105°C.	0.1°C. graduations, 24" long, 3" immersion, white background, mercury fill.	27.00
CO1C-6	-10°C. to +110°C.	1°C. graduations, 13" long, 2" immersion, mercury fill, white background.	10.00
CO1C-16	-15°C. to +75°C.	0.2°C. graduations, 14" long, 2" immersion, white background, mercury fill.	25.00
CO1C-13	+20°F. to +600°F.	2°F. graduations, 18" long, 2" immersion, yellow background, mercury fill	15.00
CO1C-15	+20°F. to +500°F.	2°F. graduations, 14" long, 2" immersion, yellow background, mercury fill.	15.00
CO1C-14	0°F. to +230°F.	2°F. graduations, 13" long, 2" immersion, yellow background, mercury fill	11.00
CO1C-10	0°F. to +220°F.	2°F. graduations, 5⅞" long, total immersion, red fill.	8.75

BLUE M

BLUE M

STAINLESS STEEL SHEATHED TUBULAR HEATERS

with U.L. Listed TRIGGER CONTROL
*Room to +100°C. (±¼°C. Sensitivity)

FOR WATER and POLYALKYLENE GLYCOL MEDIA

AUTOMATIC TRIGGER CONTROL . . . Has extra large fine silver contacts; U.L. Listed 20 ampere capacity, 120 V., A.C.

COMPLETE . . . Place heater into liquid. Set trigger control to temperature required. Dial plate with reference numbers furnished. Pilot lamp indicates heater operation.

PORTABLE . . . Control box of type 304, 18-8 stainless steel. All wiring complete; 6 ft. type HSJ, 3 conductor, No. 16 ga. line cord and 3 prong plug.

*This denotes wide temperature range of Automatic Trigger Control. Obtaining maximum +100°C. is dependent on volume container, load, time allowed, insulated quality of container and method of agitation

Catalog Number	Watt Density Per Sq. In.	Size (Inches)		Total Watts	Voltage 50/60 Hz. A.C.	Price Each
		"A" Dia.	"B" Height			
TH-2004	16	7½	7½	300	120 V.	$90.00
TH-2006	20	11	10½	600	120 V.	95.00
TH-2009	24	15	10½	1000	120 V.	105.00

Additional charts: **$10.50**/Box

NOTE:
Also available on special order same as above except with scale range 0°F. to +200°F. Same price as above. Please specify.
All instruments supplied for 120 V./60 Hz. A.C. For 240 V. or 480 V. operation an instrument transformer is required. Order as follows:
For 240 V.: Part No. E17A-2-1. **$13.00** Ea.
For 480 V.: Part No. E17B-2-11. **18.00** Ea.

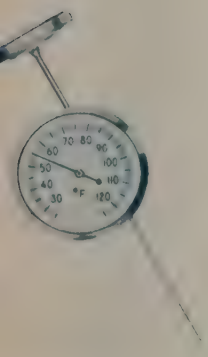
Stainless steel wet bulb water box for this instrumentation. Specify Part No. M20-M11 . . . . . **$25.00** Each

2 PEN WET AND DRY BULB RECORDER

TOTAL ACCURACY: ±1% of Scale Range.

NOT CONNECTED ELECTRICALLY OR MECHANICALLY TO CONTROL SYSTEM. MONITORS AND PROVIDES RECORDS ONLY. RELIABLE . . . ACCURATE . . . DEPENDABLE. Compact and enclosed in dust-proof cast aluminum, surface mounted case. Infrared, baked finish, hand rubbed. Complete with built-in ambient compensation. 100, 12" dia. circular charts, electric chart drive, stainless bulbs and 5 ft. stainless capillary, and wicks. Case: 14½" W. x 19" H. x 6" D. 120 V., 50/60 Hz. A.C.

Part Number	Electric Chart Drive	Scale Range	Complete Price of Instrument	Additional Charts 100/Box	
				Centigrade	Fahrenheit
	24 Hours	-18°C. to +93°C.	$540.00	C10A-4-1	C10A-4-3
	7 Days	-18°C. to +93°C.	540.00	C10A-4-2	C10A-4-4



Testing Thermometers

ALL STAINLESS STEEL

Rugged, inexpensive testing thermometers replace glass thermometers as they are practically indestructible. For Blue M ovens, incubators, dry air sterilizers, water baths, etc.

- 1¾" dia. 18-8 grained stainless case and bezel. Metal scale plate with permanent black markings.
- Scale length is 3.56 in.
- Stem of 18-8 stainless; 0.142" dia., 8" long.
- For correct temperature indications, immerse stem at least 2" in liquids and 4" in gases.
- Guaranteed accuracy: ½ of 1% of range (½°C. per 100°C.).
- Approximate weight: 1 oz.

MODELS AND SCALE RANGES

Part Number	Scale Range
CO1E-8	-10°C. to +110°C.

PRICE EACH: **$16.50**

BLUE M

TECHNICAL DATA

To Help You Get The Most Out Of Your Equipment and Procedures

The following section contains a variety of useful technical information carefully complied by Blue M engineers and included in this Catalog to help you achieve more reliable, efficient, and economical operations.

The first portion of this section is devoted to a series of Blue M Technical Bulletins prepared by Blue M personnel, and based upon years of practical engineering/operating experience with temperature controlled equipment. They are followed by a number of useful temperature, measurement, and relative humidity conversion tables as well as a comprehensive guide to the use of various metals with a wide variety of common liquids.

Additional copies of any of the following pages are available on request without cost or obligation.

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TECHNICAL BULLETIN #100-C

BLUE M

POWER-O-MATIC 60® PATENTED

SATURABLE REACTOR PROPORTIONING CONTROL AND RANGE-LOCK OVERTEMPERATURE PROTECTION

WHY USE SATURABLE REACTORS FOR TEMPERATURE CONTROL?

Temperature control systems utilizing saturable reactors have become a widely accepted, ideal means for heat control. Yet, these systems cost many times more than the single thermostat and contactor systems of control. What justifies this expenditure to perform a commonplace job? The answer, briefly, is due to the increased RELIABILITY of reactor systems. All of the major advantages are directly related to this characteristic. Consider these advantages:

MAINTENANCE:

The term reliability implies an extremely low failure rate of system components. If components do not fail, the system continues to operate. Therefore, maintenance is eliminated when it is unnecessary to replace components.

SIMPLICITY:

The POWER-O-MATIC 60® Control System is extremely simple. The RELIABILITY of a system increases as the quantity and complexity of its components decrease. A glance at Figure 1 illustrates this point. None of the troublesome, expendable components usually associated with mechanical temperature control have been incorporated into this system. The complete absence of relays, switches, tubes, thermocouples and photo cells means that NOTHING IS BEING EXPENDED IN THE PROCESS OF MAINTAINING A SET TEMPERATURE.

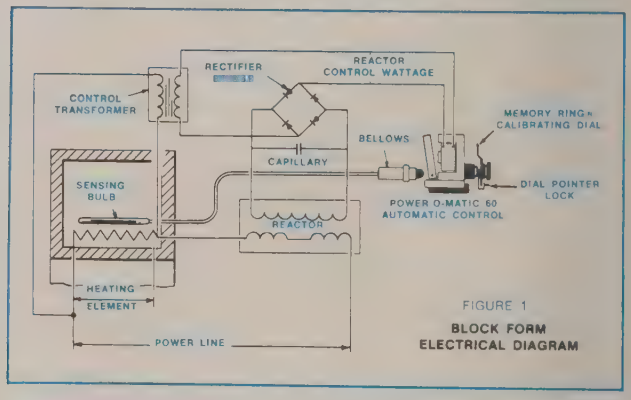


FIGURE 1
BLOCK FORM ELECTRICAL DIAGRAM

CONTROL ACCURACY:

"ON-OFF" type of cycling control can be very satisfactory and economical when requirements allow a relatively wide tolerance of temperature variation. With an insensitive, slow responding system, the rate of switching is very slow. Hence, the 5 or 10 million cycle rating of the switching devices extends over a long period of time before it "uses itself up". However, modern day requirements do not allow wide tolerances. Instead, they are becoming closer and closer. To meet them, "ON-OFF" type controls must respond faster, with more sensitivity. As a result, the increased rate of switching reduces total life of switching components; in many cases, quite drastically.

BLUE M

On the other hand, the degree of control CANNOT affect the total life of the Saturable Reactor Control. Close tolerances may be maintained indefinitely and with RELIABILITY because none of the components are rated in terms of hours of life or total operations in a given time period.

STABILITY

Let us examine the interpretation of statements such as "close tolerances" and holding temperatures "within very fine limits."

These are commonly used statements that carry a vague implication of "near perfection" but do not express specific values. A realistic look at what constitutes a "close tolerance" must be made before a value can be expressed. For example, a tolerance of ±3°C. at first glance does not appear to be a "close tolerance" in the usual sense. Many "ON-OFF" type control systems will respond much faster. A sensitive thermometer or indicator placed in an oven utilizing this control system could indicate an "ON-OFF" cycle of ±1°C. or less. Indeed, the same oven controlled by POWER-O-MATIC 60 would indicate ±0°C., tested the same manner. Viewing the control characterisitics at any given instant would indicate that it was well within the tolerance. However, let us interpret this to mean as it frequently does "at a condition of equilibrium, the temperature at no point in the oven shall deviate from the controlled temperature by more than ±3°C. over an extended period."

Combining the control tolerance with the time factor has created the term STABILITY. Stability asks the question, "How close can you control set temperature and for what period of time?" "ON-OFF" control systems can offer serious difficulties in adhering to these specifications. If it is cycling at ±1°C. it has already used 1/3 of the tolerance due to its operating characteristics. Heating chambers are rarely perfect so that some points within the oven will be higher and/or lower than desired. Assume the chamber is a good one and the temperature is within ±1°C. at all points. The chamber is being held to ±2°C. (2/3 of tolerance) overall accuracy. This leaves 1°C. in either direction to allow for the multitude of factors producing temperature drift over an extended period of operation. This drift is inherent in most control systems and may be caused by a number of factors. For example, internal influences such as drift produced as contacts burn away, changing the spacing between them, aging and changing of characteristics of electrical and electronic components, intermittent and low strength welding of contacts causing momentary temperature peaks, and many others. External influences affecting control system stability are line voltage fluctuations and severe ambient temperature variations. Viewed in this light, it becomes obvious that ±3°C. is not an easy specification to meet on these terms. When you can meet it, you know with confidence that you are holding temperature "within very fine limits."

The POWER-O-MATIC 60 offers the advantage of being inherently stable due to its non-cycling, proportional power input method of control. Exact amounts of power required to hold the temperature are applied to heating element, changing only in response to load changes and line voltage changes. Its component characteristics do not change with age or usage. The only deviation from a set temperature will be a slight drift created by severe line voltage and ambient temperature variations.

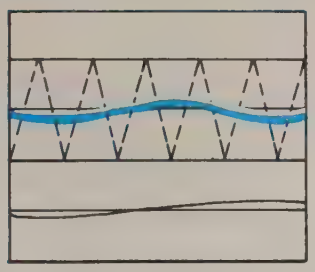
In most cases, this drift factor would be well within the cycle tolerance of an "OFF-ON" controller. See Figure 2.

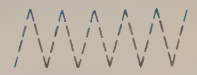
SAFETY: (RANGE-LOCK)

Because this system is RELIABLE, it is SAFER. The same design and operating characteristics that make the sytem reliable also contribute to its safety:

a. Assured operation of system prevents hazards from over-temperature "run away."

FIGURE 2





CONVENTIONAL CYCLING OF "ON-OFF" THERMOSTATIC CONTROL

POWER-O-MATIC 60 SATURABLE REACTOR CONTROL NON-CYCLING

b. Elimination of all arcing components minimizes danger of igniting volatiles in the atmosphere around the oven.

c. Elements operating at reduced voltage minimize hazard of igniting volatiles in the oven because operation at reduced watt density loading results in cooler element temperatures relative to work chamber temperature.

OTHER ADDITIONAL ADVANTAGES:

There are a number of "fringe benefits" when reactors are used in lieu of "ON-OFF" control.

a. SOURCE OF VOLTAGE STABILITY. Since reactors smoothly and steplessly proportion energy to the heaters, line voltage surges and transients caused by large contactors "making and breaking," are eliminated. This is advantageous when sensitive instruments must be operated from the same power source.

b. DEMAND METER. On multiple oven installation, power cost can be reduced by merely staggering the run-up time of the various ovens. Since reactors proportion the exact amount of energy to sustain the temperature, the demand meter will register only the exact amount of power being consumed by the entire group of ovens. The same group of ovens utilizing "ON-OFF" control will raise the demand meter to some higher value because the temperatures are being maintained by means of cycling a higher K.W. than is actually required.

One can conclude from this that units equipped with POWER-O-MATIC 60 and Range-Lock offer ultra-reliability, accurate means of control, safety, minmized maintenance plus many other advantages. These features, coupled with the fact that Blue M's reactor system is competitive-in-price to the ordinary "ON-OFF" control system, merit serious consideration by every user of temperature control equipment. It is appropriate to state: "You cannot afford to purchase other devices which do not offer the advantages we guarantee."

This Catalog contains the complete POWER-O-MATIC 60 story including block wiring diagram, how POWER-O-MATIC 60 operates, drawings, etc. We list a diversified selection of units and temperature ranges for ovens and environmental cabinets.

Our unique 5 year Guarantee is proof of our accomplishment: an unparalleled breakthrough in the art of proportional temperature control.

Additional copies of this and other Blue M Technical Bulletins are available upon request.

TECHNICAL BULLETIN #101-B

BLUE M MagniWhirl® PATENTED IN U.S.A. AND CANADA

CONSTANT TEMPERATURE LIQUID BATHS

NOW FEATURE NEW SOLID-STATE DESIGN FOR IMPROVED RELIABILITY

A proper understanding of this subject requires the following analysis of equipment use and definition:

A. TEMPERATURES other than environmental must be accurately provided.
B. PROVIDED temperature must be constant—in degree, in time, and throughout the entire bath.
C. FLEXIBILITY is a "MUST"—wide range, readily changeable temperature level, and prompt dispersion of temperature change.
D. WORKING AREA—maximum consistent with space, entire area accessible, and designed to minimize specimen damage
E. ENGINEERED to provide—long service life, and quiet, efficient operation

It is apparent that providing an accurately controlled, non-environmental temperature requires a quality sensing and control mechanism.

CONSTANCY of temperature, on the other hand, requires a more careful analysis. First, with respect to heating or cooling, temperature control can only be directly applied to a small percentage of the total liquid volume. Even temperatures throughout the bath, therefore, require liquid circulation. However, mere circulation is not enough. Most of us have had experience, when swimming, of feeling pockets of water of varying temperature. The Gulf Stream in the North Atlantic is a well-known example. The one notable characteristic of such a condition is a difference in circulation or flow rate between such pockets of water. Thus it is apparent that uniformity of circulation throughout the bath is a first requisite to avoid varying temperature pockets in the bath.

To maintain temperature constancy in time, circulation must be such that the rate of caloric supply exceeds caloric transfer at areas of contact with ambient conditions. In addition, specimen safety dictates gentle circulation.

To avoid relatively hot or cold currents (heating or cooling elements) from drifting through the bath and upsetting bath constancy, it is desirable to maintain the minimum practical temperature differential between the set bath temperature and the power element or source. This can most efficiently be done in combination with uniform, gentle liquid circulation.

BATH FLEXIBILITY demands a high capacity, incrementally controllable power source. Range requires high capacity, and incremental control desirably leads itself to temperature constancy especially at lower temperatures. Both contribute to reduction of time lapse in changing temperature levels. Incremental control also aids in maintaining minimum temperature differential between power element and liquid.

WORKING AREA and user convenience are synonymous. The area should be readily accessible and should be at a maximum relative to bath-occupied floor or table space. The location of the circulating mechanism and velocity of circulation should minimize accidental specimen damage.

From an ENGINEERING standpoint, the bath must offer quiet, efficient and economical operation and long life. To state a few obvious points, material, material fabrication, and apparent quality of manufacture must each be considered by itself and in over-all operative relation.

TECHNICAL BULLETIN #102-B

CORROSION RESISTANCE OF STAINLESS

Blue M has prepared this bulletin to establish and remedy the causes for premature corrosion or deterioration of stainless steel equipment. Our popular MAGNI-WHIRL® Baths and VAPOR-TEMP® Relative Humidity Chambers, using water as a liquid medium, are just a few whose life and use will be prolonged with reasonable care.

Why use stainless steel? It is one of the best materials commercially available allowing a manufacturer to produce equipment economically and with sales appeal. Its utility has been proven. It is, without a doubt, one of the work-horses of industry. But remember—stainless steel is termed "corrosion-resistant", not "corrosion-proof."

Many corrosion resisting problems would be minimized with periodic maintenance and cleaning. Unfortunately, the magic name "Stainless Steel" immediately brings to mind phrases such as "life time service," "no maintenance," etc. This is due partially to the excellent corrosion resistant properties it does have and particularly to the promotional and advertising efforts of makers and users of stainless.

When ordinary tap water is placed in a stainless steel bath and is allowed to operate at temperatures above +50°C. (+122°F.) for 3 or 4 months continuously, some amazing and somewhat discouraging effects may be noted. This is quite alarming in a piece of laboratory equipment. On the other hand, can you imagine what your stainless steel cookware, cutlery, porcelain bathtub or sink would look like if exposed to these conditions continuously for several months without cleaning? Their long life and beautiful appearance is natural when you consider that they are virtually scoured after every use.

Each type of stainless reacts somewhat differently to corrosive media. Therefore, from a manufacturing standpoint, it is necessary to select and use the type which is most practical, readily obtainable and economical. Blue M normally uses Type 304, 18% chromium and 8% nickel, the type most widely used. If your application is common, the performance of stainless application may be confidently predicted. Nonetheless, under actual service conditions, unexpected impurities in chemicals and chemical compounds frequently alter the result.

Some impurities inhibit corrosion, others accelerate it. We highly recommend consulting a corrosion resistance table if there is any question as the the recomended type for your particular application.

Practically all halogen (chlorine, bromine, fluorine and iodine) salts tend to pit stainless. The degree of pitting depends upon such conditions as concentration, temperature, degree of aeration and time of contact. As a rule, the higher the chromium and nickel content, the greater the corrosion resistance.

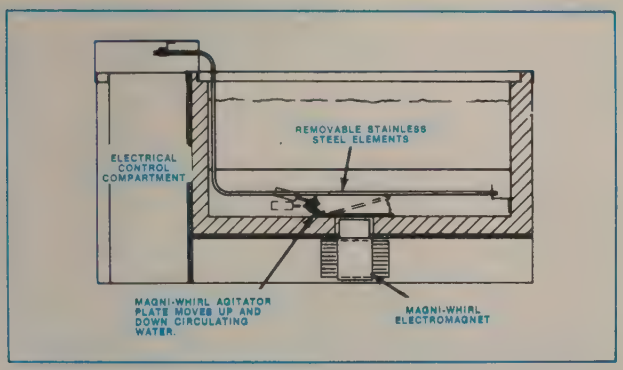
There are several well established causes of premature corrosion or deterioration of stainless, but we are primarily interested here with water as the medium.

1. Tap water conditions vary widely throughout the country. Hard water, sulphur water, purified water and even distilled water affect stainless tanks if operated unchecked.

BLUE M

In light of this we would like to briefly analyze BLUE M MAGNI-WHIRL Baths.

They employ sensing bulbs arranged next to the area of power application to reduce time lag between change and reaction to change. The sensing bulbs are connected to a unique power element controlling switch assembly developed by Blue M. This further increases sensitivity by employing mechanical advantages resulting from a change of linear to pivotal motion. Of course, only the best available components are used.


REMOVABLE STAINLESS STEEL ELEMENTS
ELECTRICAL CONTROL COMPARTMENT
MAGNI-WHIRL AGITATOR PLATE MOVES UP AND DOWN CIRCULATING WATER.
MAGNI-WHIRL ELECTROMAGNET

MAGNI-WHIRL Baths also feature a patented circulating method with an alloy counterweighted rocker plate agitator. This is automatically rocked at factory-set, but variable, intervals to induce uniform circulation throughout the bath.

To minimize caloric exchange and thereby eliminate excessive circulation velocities, all MAGNI-WHIRL Baths have insulated walls. The unique Blue M method of total and uniform liquid agitation assures constant temperature throughout the entire bath over extended periods.

We believe that Blue M MAGNI-WHIRL Baths offer flexibility to satisfy every user. Incremental and controllable power elements offer a wide range of temperatures by a simple manipulation of a power selector switch. The incremental power elements and control also aid in rapid change when desired. A further feature is a two-level control switch for safety and user convenience in many applications. Of course, the Blue M unique agitation method aids in rapid condition change. Blue M Baths also have extensive element area. This, combined with the uniform circulation and incremental control, results in low level watt density in the elements and, therefore, a minimal practical temperature differential between the bath and element. Constancy of temperature is thus achieved. In accessibility of working area, we believe MAGNI-WHIRL Baths to be unequalled. The comparatively small, full-visibility jar baths provide bath access and easy specimen observation. In all MAGNI-WHIRL Baths, the entire liquid surface is available working area. These features are provided in a minimum of floor or table space. Also, the liquid agitating plate is located adjacent to the bottom of the bath. This location helps assure maximum working area and avoids accidental damage to specimens due to contact with the agitator.

Blue M Baths utilize corrosion-resistant, non-magnetic material wherever practical. A quality electromagnet is positioned outside bottom of tank so that when energized, its field will extend through the non-magnetic tank wall and engage a magnetic attraction member attached to the agitating plate. In operation, the solid-state "packaged" power supply—protected by a KLIXON® thermostat—energizes the magnet, causing the agitator plate to quietly and firmly rock. After a predetermined time, power to the D.C. magnet is interrupted, and the agitator plate rocks upward. This steady pulsation, which may be varied to suit virtually any need, assures gentle, thorough, agitation of the entire liquid mass. Use of solid-state components eliminates timing relays—and relay failure. Elimination of relay clicking makes MAGNI-WHIRL Baths so quiet that a neon pilot light has been added to show operation. MAGNI-WHIRL Baths are also virtually immune to line voltage variations and operate efficiently despite ambient temperature changes. An extremely sensitive Dual Microtrol provides accurate temperature control and overtemperature protection. The components and mechanical and electrical design of all MAGNI-WHIRL Baths insure long life, quiet, economical and efficient operation.

This unique development is embodied in a variety of baths for use under a wide range of operating conditions and employing a variety of fluids. For a complete listing of MAGNI-WHIRL stainless steel baths, full visibility jar baths, mechanical refrigeration baths, serological, shaker and hydrometer jar baths, please see index of this catalog. MAGNI-WHIRL Constant Temperature Baths, Series MW-1110, and Full Visibility Jar Baths, Series MW-1152SSA are U.L. Listed. Additional information or our suggestions on special design or applications will be made available by directing inquiry to the factory.

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2. Surface "rust" will appear occasionally due to slight imperfections in the stainless or due to microscopic pieces of tool steel imbedded when the unit is formed, punched and sheared. This can usually be wiped off, but does generally reappear.
3. Corrosive chemical solutions are formed in the water. Sometimes the customer is processing something that affects the water or spills chemicals unnoticed and unintentionally. The fact that water is evaporating continuously and fresh make-up water is added can be injurious. As the water evaporates, the remaining water tends to build up a more concentrated solution due to the purifying agents, natural water salts, spillage, etc.
4. Some of the solution will support an electrolytic action between dissimilar tank metals.
5. Heavy calcium deposits will "plate out" on the sides of the tank in the form of a heavy scale. Pitting will sometimes occur beneath the scale. This is called "crevice corrosion."
6. Even distilled water is somewhat corrosive. It is mildly acidic and will affect solder joints, etc. Solder seams will turn a greenish color when immersed in distilled water at high temperatures. It has less effect on the stainless tank than hard water deposits.
7. If something combines with the water to form a salt solution, rapid deterioration will result. Pitting and corrosion right at the water line indicates that salts are present. The salt water itself does not affect the stainless, but damage occurs at the water line where vapors combine with oxygen.
8. If the bath is operated in a corrosive atmosphere, harmful vapors can combine with the water to form a corrosive solution. Such vapors can also pit the outside of the unit.

These causes of corrosion were determined by tracing down "corrosion complaints." In some cases the causes were volunteered by qualified chemists using the units, and in others the facts were presented to the metallurgical department of stainless producers.

WE HIGHLY RECOMMEND ALL UNITS BE DRAINED AT LEAST ONCE A MONTH, CLEANED AND REFILLED WITH FRESH WATER TO AVOID BUILDING UP CONCENTRATED SOLUTIONS. Sometimes a long term test cannot be interrupted and must run for months. Under these conditions it is impossible to clean and refill the unit frequently. One answer is to use partially de-ionized or "softened" water. Commercial water softeners are available at reasonable prices and are an excellent investment for any laboratory, especially where water is exceptionally "hard."

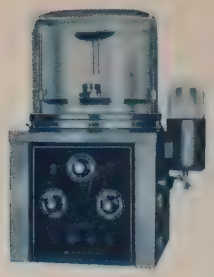
DO NOT ABUSE OR NEGLECT YOUR EQUIPMENT. You will prolong the life and appearance by following these simple suggestions:

1. Use a damp cloth wrung out in mild, soapy solution.
2. Dip a clean cloth in clear hot water. Wring out nearly dry and wipe off soapy solution.
3. Dry with a soft clean cloth.
4. Once a month, where practical, scour surfaces. Use a high quality scouring compound that will not mar the surface—Bon-Ami or equal. Tartaric acid may also be used. There are several excellent, prepared stainless steel cleaning compounds available. Glass wax, for example, removes surface marks and brightens appearance. For stubborn dirt, spots or blemishes use a STAINLESS STEEL WOOL. DO NOT use ordinary steel wool as it will scratch and cause "rusting."
5. Grease or oils may be removed by cleaning with vapor degreaser or other solvents such as benzine, naptha, thinner, etc. "Tide" or equal is also recommended.

TECHNICAL BULLETIN #103-B

BLUE M vapor-temp® (PATENTED)

CONTROLLED RELATIVE HUMIDITY CHAMBER



WITH NEW SOLID-STATE SWITCHING FOR GREATER RELIABILITY

VAPOR-TEMP is a small, reliable, low cost Humidity Chamber developed to meet many MIL, JAN, NEMA and ASTM tests. Heretofore, humidity tests had to be conducted in one of two ways—by use of chemical solutions and desiccator jars, or with a conventional, commercially manufactured, controlled humidity cabinet.

The former method was inconvenient, inaccurate and unreliable. Often, tests had to be conducted by experienced people skilled in chemistry and psychrometry to produce even mediocre results.

The latter method undoubtedly provided or at least approached the desired results, but also had many disadvantages. The largest objection was the tremendous expenditure required to purchase this equipment coupled with the fact these cabinets were too large for a great majority of tests. It is not practical for a small laboratory or company to invest several thousand dollars in equipment needed only a few days a month. Thus, smaller firms will invariably send their humidity test work out to larger organizations already possessing this equipment. This is usually done for economic reasons only, as most research or quality control people prefer to do their own testing in their own labs, under their personal supervision, in order to be absolutely certain the test results are reliable.

Another problem is the long time required to conduct a temperature humidity test. Some last several weeks and even months. This means that when one test is started, testing on all others must be postponed until the first is completed: it cannot generally be interrupted once started. This has resulted in what is known as "departmental pooling" of tests. Tests on important items are deliberately postponed until equally important items from other departments are ready, so several items may be tested simultaneously. These delays are not only irritating to personnel, but costly. Obviously it is also impracticable, even for larger firms, to purchase a number of large chambers for multiple tests—both from financial and space standpoints, since a quantity of these units would occupy costly area in a laboratory.

VAPOR-TEMP does not eliminate the need for either type of humidity chambers, but it does eliminate many disadvantages found in both. VAPOR-TEMP also provides additional advantages found in both. VAPOR-TEMP also provides additional advantages. Within their working range of temperature and humidity, they will perform equal to, and in most cases superior to, the large expensive cabinets.

VAPOR-TEMP obtains a specific set temperature and humidity faster than more expensive cabinets. Installed and operated by inexperienced personnel, it makes multiple, simultaneous tests feasible due to its low cost and small size. Several units may be purchased for the price of one large cabinet. Space requirement for several cabinets is no more than necessary for a single, large unit. VAPOR-TEMP allows even small laboratories with limited budgets to conduct their own tests.

VAPOR-TEMP allows full visibility of the material being tested and offers full accessibility when operations must be performed on the test work after positioned: wiring of complicated electronic components, etc. The entire chamber is removable; the piece to be tested is entirely exposed and accessible.

On the other hand, VAPOR-TEMP does not have the extended range for some tests. It does not have sufficient volume to enclose all parts to be tested. In these instances, the user must buy a larger cabinet available in capacities from 1.47 cu. ft. to 27 cu. ft. and designed for single steady state or full range conditions to meet military test procedures.

The success and development of VAPOR-TEMP Relative Humidity Chambers, other than their low cost, were dependent mainly on the results of an exhaustive survey which indicated a large percentage of humidity-temperature tests lie in the range above ambient to +170°F. and humidity conditions above 90% R.H. Technicians who test in this range were forced to buy a full range expensive cabinet because there was nothing else available. Laboratories were penalized and were paying for a wide range and extra volume which might never be used.

TECHNICAL BULLETIN #104-A

OVERTEMPERATURE PROTECTION

AN EXTRA MEASURE OF SAFETY IN A SAFETY-CONSCIOUS WORLD—NOW STANDARD ON MOST BLUE M UNITS

As you review the units in this catalog, you'll find most of them have Overtemperature Protection (OTP) standard. Generally, this added safeguard has been included at no additional cost to you.

We have taken this progressive step forward for three important reasons:

1. Any constant temperature controlled equipment—no matter how well originally designed and built—can eventually fail. This can be caused by operator error, misuse of the equipment, failure of a component, or just old age. (Eventhough our patented POWER-O-MATIC 60® units, for example, operate almost indefinitely and are actually guaranteed for five years, they might eventually wear out.) Since the workload tested or processed often represents an investment many times the value of the unit, it just makes good sense to do everything practical to safeguard it. Built-in OTP does.

By presenting this background material, we feel the basic operation of our cabinet and its function will be more readily understood. We do not believe the basic operational principle is new, nor does it incorporate any new and superior devices. However, we do know it produces accurate, easily obtainable and reproducible results at very low cost.

VAPOR-TEMP consists of a stainless steel base to contain all necessary controls, motor and blower, cooling coils and heating elements. Top surface of this section receives an inverted, cylindrical PYREX jar of standard size manufactured by Corning Glass Company. The jar forms the work chamber sealed by rubber gaskets fitted to a 2" high stainless band. Full visibility is assured; the thickness of the PYREX provides adequate insulation and vapor-tight, double-wall, insulated chamber of corrosion-resistant material.

The blower intake opening is centrally positioned on top of the stainless base and concentric with the inner edges of the inverted PYREX jar. The blower discharge apertures are small holes, positioned in a circle with the stainless band. Air-flow pattern withdraws air into center intake opening, passes over the humidifying and temperature controlling devices, and discharges this air upward along the inner sides of the jar. This velocity is proportional to reach all areas within the jar before return. When the air leaves the jar, it is forced over the cooling coils. This cools the air to a proper dew point. This temperature depends upon the conditions being controlled and the corresponding wet bulb control setting. At the same time, the air is passing over an open water supply and is approaching a saturated condition at the cooler temperature. The air then passes over the dry bulb heater where it is heated to the desired temperature depending upon the setting of the independent dry bulb control. This saturated air then becomes air of a higher temperature and a lower relative humidity.

This control is possible because heated air can hold more water vapor than cooler air. From this it can readily be seen that most any desired combination of temperature-humidity condition may be obtained by first chilling the air to desired dew point, saturating it, and then heating air back to its original temperature. The lower the air temperature (cooling), the lower the relative humidity will be when this air is reheated and re-enters the chamber. Conversely, the less air is cooled the higher the relative humidity when the air re-enters the chamber.Air is cooled by circular copper coils surrounding the blower, through which ordinary tap water is allowed to flow when the wet bulb control senses the humidity condition is too high.

The wet bulb temperature does not actually respond to humidity changes, but rather to temperature changes of the chilled air after it leaves the cooling coil. When air in this position is warmer than control setting, control opens a solenoid valve. This allows tap water to flow through copper coils, which in turn, cools the air flowing over them. The wet bulb control sensing bulb is in physical contact with one of the outer edges of the water cooling coil to facilitate rapid response to temperature change. Even though wet bulb control is actually responding to temperature changes within the conditioning compartment, it results in a humidity change within the working chamber after the air has been reheated to set dry bulb temperature.

Expressed another way, for any given dry bulb temperature every specific temperature setting of chilled air will result in a corresponding relative humidity change within the chamber. A given condition is easily obtained by consulting a standard psychrometric chart to cover the desired temperature-humidity condition into wet bulb and dry bulb temperatures. Set wet and dry bulb controls to correspond. For example, a condition of +100°F. and 93% is desired. From the chart, this is a dry bulb temperature of +100°F. and a wet bulb temperature of +98°F. Wet bulb control is not actually controlling or responding to wet bulb temperature changes directly. Control dial is calibrated in wet bulb temperatures for convenience in setting only.

Humidity range is limited by temperature of usable tap water. Complete range is shown graphically and based on +70°F. water source. Obviously, if +40°F. tap water is available, a considerably lower minimum humidity may be obtained. If the water is +90°F. minimum range will be higher than indicated on chart

Complete construction details on Blue M VAPOR-TEMP Relative Humidity Chambers, including models with mechanical refrigeration, are shown in this catalog. Please refer to the index. Emphasized is a new solid-state SCR switching development on wet and dry bulb circuit which eliminates all relays—and relay failure. This and other important improvements make these already proven units more reliable than ever.

Other environmental equipment for reproducing military specifications with unusual stability, reliability, accuracy and reproducibility is available. Literature upon request.

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2. Government's regulatory interest in safety is increasing, as evidenced by the National Occupational Safety Act (OSHA). To date, the specifics of this law pertaining to the units in this catalog have not been spelled out. But it is only a matter of time before they are. We are confident that the inclusion of OTP will help these units comply with whatever standards OSHA adopts and enforces. OTP will help avoid costly compliance modifications at some (not too distant) future time.
3. A combination of recent technological advances and a constant improvement in our own design/manufacturing expertise has enabled Blue M to develop truly efficient OTP systems at a cost considerably below what comparable safeguards would have cost only a few years ago. Believing so strongly in the inherent value of such added protection, Blue M has simply installed them at no increase in cost on as many units as practical.

We emphasize that Blue M OTP is built into the unit. It is an integral part of the chamber, not a separate device tacked on as an afterthought. Typically it prevents excessive temperature rise and resulting damage to equipment and workload by automatically shutting down the unit in the unlikely event of component failure, combustion within the chamber, etc.

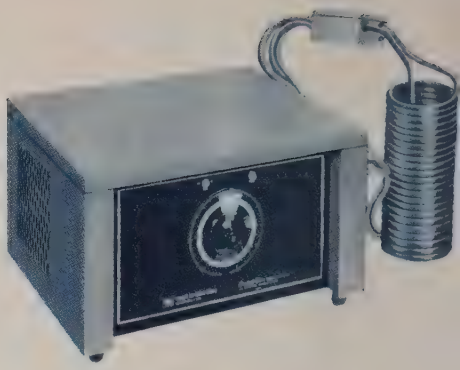
Like our own control systems, Blue M OTP has been designed, engineered and built to complement our chambers exactly. Typifying these safeguards is the new, advanced MAX-SET™ system described on page 14. Not only does it shut down the chamber in the event of failure, but it actually differentiates between a minor external disruption of normal operation and a true failed condition—and tells the operator which is which! This exclusive development is standard as described on many Blue M chambers and its unique circuitry has also been incorporated in others to improve the operation of commercial instrumentation. MAX-SET is also available as an accessory for existing equipment.

Blue M products have always been known for their quality and inherent safety. The addition of built-in OTP is one more important step aimed at keeping Blue M chambers the safest you can buy.

TECHNICAL BULLETIN #105-C

BLUE M *Constant-Flow* Patented

PORTABLE COOLING UNIT



A NEW CONTROL PRINCIPLE

ADVANTAGES

a) Precision temperature control throughout equipment temperature range.

b) Longer Compressor life: it is known that repeated starting and stopping is more detrimental to compressor life than constant running.

c) Fully automatic compressor capacity control.

d) Longer Thermostat life: thermostat does not switch motor current "on" and "off". Current through thermostat is 10 watts maximum as consumed by solenoid coil energization.

e) Rapid response to widely varying loads.

CONSTANT-FLOW is a precision assembly designed for application where operating economy is over-shadowed by the extremely small temperature differentials required. This differential is limited only by the sensitivity of controlling thermostat. Our standard thermostat maintains the differential within ±0.15°C. providing liquid medium being cooled has adequate agitation.

Do not compare CONSTANT-FLOW with home refrigerators where operating economy is of prime importance. A temperature variation of ±5°F. has little effect on a pound of butter or a quart of milk.

How can a portable cooling unit meet any and all applications the laboratory may have? It requires nothing more than a "quality system". Blue M CONSTANT-FLOW Portable Cooling Units use an "Expansion Valve" System. A thermostatic expansion valve "meters" a refrigerant in proportion to load and capacity of the compressor. This valve allows a proper amount of refrigerant to flow for its own particular load to be controlled. Because the valve "meters" refrigerant to maintain maximum evaporator capacity and efficiency at all times, and due to the metering of refrigerant at a rate proportionate to the heat load, thermostatic expansion valves are ideally suited to scientific equipment and other applications where varying heat loads are the general rule. Consequently, Blue M's CONSTANT-FLOW system is truly a versatile unit and performs efficiently within its rated capacity.

Continuous operation of the compressor greatly reduces maintenance. Electrical problems are minimized, compressor lubrication is improved and liquid refrigerant migration is avoided.

Actual control of liquid media temperatures are accomplished through a hot gas bypass solenoid valve, actuated by the controlling instrument.

The hot gas bypass system provides passage of compressor discharge gas directly to the evaporator. Introducing the hot gas into the evaporator inlet immediately after the expansion valve has the effect of creating an artificial cooling load while reducing compressor capacity in proportion to the amount of gas bypassed.

In operation, when the temperature of the media to be cooled is above the set point temperature of the control, the refrigeration system is operating at full capacity. During this condition, the "hot gas bypass" capacity control circuit is de-energized. When the temperature of the media is below the setpoint temperature of the control, the "hot gas bypass" capacity control circuit is energized.

The rapid change between cooling the heating of the evaporator at the setpoint temperature minimizes or eliminates temperature undershoot normally experienced due to the temperature difference between the

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TECHNICAL BULLETIN #106-B

HEATING ELEMENTS

AND THEIR APPLICATION TO LABORATORY AND PRODUCTION EQUIPMENT

The purpose of any oven is to provide a controlled constant temperature. The critical demands of modern industry indicate the oven must:

A. Maintain temperature level in point of time.
B. Provide temperature uniformity throughout the chamber.
C. Provide rapid chamber response to condition change.
D. Offer long service life.

To meet these requirements, one of the methods of heat transfer—convection, conduction or radiation—may be used.

CONDUCTION is not practical from a cost and function standpoint, and is not commonly used in industrial and laboratory ovens.
RADIATION principles indicate:

1. Radiant energy moves linearly from source to object with possible unequal object heating.
2. Specimen absorption of radiant energy is a function of surface quality as well as temperature, with possible non-uniform results.

BLUE M

media and the evaporator temperatures. In addition, this system avoids the need for a thermal heat source to stablize at ambient temperature or conditions of light loads.

The hot gas bypass circuit also has a separate hot gas flow regulating valve. This is factory adjusted and set at a point to limit hot gas flow to achieve good system balance. System operating pressures are very stable, with only a slight change between full load and no load conditions. In this manner, good refrigerant velocities are maintained in the evaporator to assure proper oil return and normal operating compressor temperatures.

Blue M CONSTANT-FLOW Portable Cooling Units also feature a high quality, 18-8 stainless cabinet for excellent resistance to laboratory atmospheres. Complete details are shown in this catalog. Please refer to the index.

TYPICAL APPLICATIONS FOR BLUE M PORTABLE COOLING UNITS

In design, performance and utility, these units offer practically unlimited versatility. A few of the more interesting uses to which they have been put are described here. Some are common, some are unusual, all are practical. One may fit your needs exactly—or suggest where you can use a Blue M Portable Cooling Unit profitably. We emphasize that they are designed to cool liquids, not air. Do not (as has actually been tried with predictably poor results) attempt to lower the temperature inside a conventional household freezer by hanging a Blue M Cooling Coil inside. These are excellent units—but not miracle workers. (On the other hand, they have been used effectively to cool water in aquariums where water temperature must be kept constant to protect delicate tropical marine life.)

TYPICAL INDUSTRIAL APPLICATIONS

HELPS EXTEND BEARING LIFE
ON LARGE PRODUCTION MACHINE

Requirements called for greater machine load and speed. This caused bearings to overheat, with resultant short life. A Portable Cooling Coil, immersed in the machine's bearing oil sump, enabled the machine to function under the new load without difficulty.

SAVES MONEY IN COOLING OIL
FOR ELECTRIC SWITCH GEAR

High-powered oil-immersed electric switch gear required cooling of oil for proper operation. A Portable Cooling Unit handled the job at a cost far under an oil-to-air heat exchanger big enough for the requirement.

PAYS FOR ITSELF OVER AND OVER
IN CHEMICAL PLANT CONDENSER COOLING

A Portable Cooling Unit, a reservoir and a circulating pump are ideal to cool condenser water for chemical plant distillation equipment. Several plants report that such installations save equipment costs many times over. Also, distilled or demineralized water can be used, almost eliminating cleaning and maintenance—an additional important savings.

MAKES PRODUCTION SPEED
INJECTION MOLDING ECONOMICALLY
FEASIBLE

In an injection molding process, the molding die had to be cooled well below molding temperature before it could be opened. Imbedding a Portable Cooling Unit in the die body substantially reduced the time needed to complete the molding cycle, enabling the process to become economically feasible for production speeds.

CONDUCTS TEMPERATURE GRADIENT
TEST ON ALUMINUM BLOCK

A block of aluminum was machined to accommodate the probe of a Blue M Portable Cooler. Cooling action of the unit enabled tests to be efficiently and reliably conducted.

TYPICAL LABORATORY APPLICATIONS

Obtaining cooled liquids at precise temperatures for recirculation to cooling condensers, refractometers, spectrophotometers and similar equipment. As in the chemical plant application above, distilled or demineralized water can be used, sharply reducing maintenance costs. Removing process heat and maintaining proper temperature in pilot plant and laboratory size anodizing equipment.

Lowering water temperature for below ambient operation of water jacketed incubators and water baths.

Slow the loss of dry ice by immersion in dry ice storage cabinets. Chilling and holding milk samples for test. This applies to liquids of all kinds.

These and innumerable other common (and not so common) applications are handled with standard Portable Cooling Units as described in this catalog. Often, however, special applications arise requiring use of special coil designs or unusual materials. A recent example called for cooling sulphuric acid solutions. Blue M fabricated a special coil of Carpenter #20 stainless steel to handle it. If you have a special application, outline your requirements to us. Chances are we can engineer a unit to meet your exact requirements—quickly and economically.

3. Radiating body and radiant transfer respond slowly to change.

Therefore, for close oven control tolerances and chamber uniformity over the wide range of oven use, radiant heating does not meet the critical demands of industry.

CONVECTION heat transfer, when combined with properly designed operating elements, offers close tolerance control and chamber uniformity.

It is important that a clear distinction be kept in mind of the terms used (sometimes inaccurately) to define oven RESPONSE. First, the main interest of the user is the over-all oven response sensitivity, i.e., the elapsed time between condition change and correction or return to control point. This is a function of two elements: control response sensitivity and element response sensitivity. Control response sensitivity depends on the sensing and control equipment used. Element response sensitivity depends on heat applying mean's ability to dissipate the required units of heat to the chamber air to correct the undesired condition and, thereafter, to quickly halt heat dissipation upon condition correction. Therefore, to meet the user's interest in over-all oven response sensitivity, it is necessary that the oven have both a sensitive control and a sensitive element. A sensitive control with a relatively slow response control, simply will not fill the bill. A chain is only as strong as its weakest link.

A major consideration in oven efficiency is temperature and watt density of the heating element. Close tolerance control is best achieved by minimizing the temperature differential between the heat source and the chamber control point. Temperature in a given resistance wire increases as the watt density in the element increases. This does not mean that watt density is proportional to temperature. It is possible to select an element capable of high temperatures that offer a low watt density. However, for a given element, if the watt density is increased, the temperature will also increase. Watt density is properly defined as the power or watts per unit surface area of the heating element, i.e., that element through which the electrical current is actually being conducted. A low effective watt density also increases the service life of the heating element.

It has been common to calculate the watt density of sheathed elements based on the surface area of the sheathing. It is apparent that the resistance wire in the element to which the power is actually applied will

be at a considerably higher effective watt density. Because temperature increases with watt density, it follows that it is difficult to minimize the temperature differential between heat source and control point when employing sheathed elements.

The two heating elements most frequently encountered are the sheathed type and the open wire type. While each presents certain advantages in different applications, we are considering them from the standpoint of oven operation only.

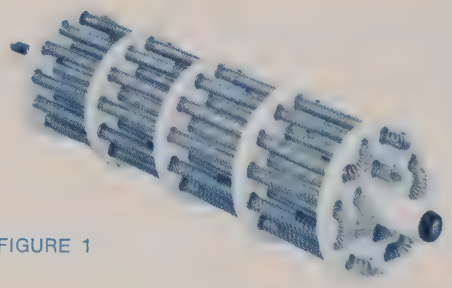

FIGURE 1

The sheathed type element presents certain disadvantages in a convection oven:

1. A slower responding element which reduces over-all oven response sensitivity.
2. The larger mass of the sheathed element together with its natural time lag, intensify the problem of overshoot and undershoot from temperature control point.
3. The higher effective watt density in the resistance wire portion of the element affects service life.
4. Difficult to minimize differential between element temperature and control point with serious effect on close tolerance control.
5. The larger physical size of the sheathed element prevents high element concentration in small volumes with resulting effect on capacity in either gravity or mechanical convection ovens.

The open wire element, on the other hand, offers many advantages:

1. A rapidly responding element to complement a sensitive control, and thereby produce the desired over-all oven response sensitivity.
2. A relatively small element mass, eliminating serious residual heat retention and overshoot problems, resulting in close tolerance control.
3. Compatible with minimum temperature differential between control point and element temperature to further contribute to close tolerance control.
4. Simplifies design by providing given oven element of low watt density, thereby improving service life.
5. The relatively small physical size of the open wire element lends itself to high element concentration in relatively small volumes, thereby increasing element contact with chamber air and resulting in desired oven reliability and stability.

THE BLUE M OVEN LINE

In developing and designing BLUE M ovens, these facts led us to adopt the convection principle and to incorporate in our ovens the open wire heating element of low watt density.

For example, in BLUE M gravity ovens, we achieve accurate, reliable and stable results by distributing a large amount of open wire element over a large area. This would not be possible with sheathed elements.

In BLUE M mechanical convection ovens, the open wire element—particularly as used in the BLUE M modular disc design—offers oven performance unmatched in industry.

The modular disc design is illustrated in Figure 1. Its compactness is obvious. Over 85% of the open wire coiled element is exposed to high volume chamber air steam. When the control calls for heat, the air passing through the modular disc element immediately rises in temperature. The higher temperature air is immediately carried to and circulated throughout the chamber. Thermal lag is virtually eliminated. When the control de-energizes the element, the open modular disc design accommodates rapid heat dissipation, minimizing further temperature rise because of residual heat. In short, this design exposes a greater element surface area to the chamber air stream with less restricition on air motion than with any other type of element.

All BLUE M heating elements are designed with mechanical strength and electrical safety foremost in mind. Heavy sections of high-temperature refractory material are used. Spacings between the wire conductor and metal framing are always greater than reasonable safety requirements dictate. The resistance wire in each BLUE M element is chosen to provide high resistance to corrosive atmospheres and to assure long service life.

BLUE M ovens more than meet the critical top performance demands of modern industry. Of course, this does not imply that the sheathed element does not have many valid and desirable applications. However, it is also our opinion that the proper use of the open wire heating element in BLUE M ovens is an important factor in meeting those demands, and should be carefully considered by every user.

temperature tips

TO AID IN THE SELECTION OF YOUR EQUIPMENT

is your application critical or non-critical?

When buying equipment for a specific application consider whether it is CRITICAL or NON-CRITICAL. A price difference exists between them

For general usage and whenever the equipment must serve a variety of applications, we recommend only the unit which will handle CRITICAL work

What will you application require five years from now? Will it be of a CRITICAL or NON-CRITICAL nature?

the choice of instrumentation is very important

Good inherent potential performance is often "concealed" in an expensive temperature controlled cabinet when equipped with a poor choice of instrumentation. When selecting or installing instrumentation, make certain your choice includes (a) PERFORMANCE (b) RELIABILITY.

why use a saturable reactor control system for laboratory testing and processing or production testing?

a. You gain PERFORMANCE and RELIABILITY.
b. You avoid DOWN TIME and PRODUCTION LOSSES.
c. You gain REPRODUCIBILITY from tests through the PRODUCTION cycle.
d. You virtually eliminate maintenance.
e. Your initial investment is, generally, your last

BLUE M

mechanical horizontal air-flow provides:

a Better temperature uniformity over a large volume.
b. Larger workload capacities; no impeding of airflow.
c Faster drying and baking.
d. Repeatable results.
e Safety.
f Better efficiency.

air blower rotation for 3 phase operation

When installing a 3 PHASE unit, before placing into service, determine whether the AIR BLOWER ROTATION IS CORRECT. Incorrect blower rotation results in a substantial reduction of air-flow which seriously impairs unit operation. Often, poor results are traceable to incorrect blower rotation.

separate control . . . separate indicator

Generally speaking, best results are obtained when the control sensing bulb is placed in the area of best control action (fast response) and the indicator bulb is in the work chamber for true temperature readings. Results with this system are generally comparable to an expensive system.

efficiency of equipment can be improved

When equipment requires LEAD-IN PORTS, DOUBLE GLASS OBSERVATION PANELS, and other accessories which cause additional heat losses, we recommend you increase the heating element input to maintain maximum efficiency.

heavy loads . . . fast run-up . . . fast recovery

The above are not significant problems to Blue M equipment. While cataloged unit wattages are engineered for normal processes and suitable for a majority of applications, HIGHER or LOWER wattages can easily be provided. Review your application before you buy; it can save you production time and money.

processing volatile materials

Factory Mutual states: "Most common causes for explosion when processing volatile materials are":
a. Inadequate ventilation.
b. Inadvertently exceeding flash point of material.
c. Arcing components.

We recommend for safety to personnel and property:
a. Forced exhaust system.
b. Overtemperature protection.
c. Reactor control system
d. Welded interior.

test operations at ambient or below ambient

Test cabinets which must operate efficiently at ambient or slightly above or below ambient should be selected and installed with care. Three most commonly used systems are:
a. Forced air.
b. Tap water cooling.
c. Mechanical refrigeration.

We recommend the built-in mechanical refrigeration system because it provides a constant non-variable cooling system. Cabinets of this type should never be installed against poorly insulated outside walls, strong sunlight areas, radiators, etc.

controlling humidity was "tricky"

Previously, in controlling wet and dry bulb temperatures, if PERFORMANCE was obtained, the RELIABILITY was sacrificed. If RELIABILITY was achieved, the PERFORMANCE was lacking.

Now, you have PERFORMANCE plus RELIABILITY in POWER-O-MATIC 60® Saturable Reactor Proportioning Control System since nothing is expended in maintaining both wet and dry bulb temperatures.

thermocouples . . . are expendable

Thermocouples are the "heart" of all electronic control system instrumentation but they won't last forever. We recommend you inspect all furnaces and oven thermocouples regularly. Change them every six months. Always stock a few extra thermocouples for your equipment to reduce downtime.

basic building block a wise investment

QUESTION: Considering a program of expensive testing facilities that will ulitmately reach a value of many thousands of dollars?

If so, your application deserves something better than the least expensive basic unit you can buy. Your test chamber cost is minor when compared to the total investment. Yet, it is the BASIC BUILDING BLOCK of the installation and your entire program of testing and production depends on it.

a prototype cabinet is a wise investment

Large multiple installations should be approached carefully. Conduct through profile tests and evaluate prototype unit BEFORE proceeding on a full scale basis.

alloy interiors . . . a cure-all?

Inside chambers or complete units are, in the main, supplied with an excellent stainless steel alloy which is corrosion resistant to many liquids, gases, or chemicals. However, this commonly used grade is not a cure-all and many other types are available. Check your process and consult a Corrosion Guide. Blue M provides Corrosion Guides free for the asking.

do not abuse or neglect your equipment

Suggestions for the care of stainless steel units.
1. Use a damp cloth wrung out in a hot, mild, soapy solution.
2. Dip clean cloth in clear hot water. Wring out dry and wipe off solution
3. Dry with soft clean cloth.
4. Once a month, scour surface. Use a quality scouring compound that will not mar surface—Bon-Ami or equal. Tartaric acid may also be used. There are several excellent, prepared stainless steel cleaning compounds available on the market. "Glass Wax" removes marks and brightens appearance. For stubborn dirt, spots or blemishes use a STAINLESS STEEL WOOL. DO NOT use ordinary steel wool which scratches surface and causes 'rusting".
5. Grease or oils may be removed by cleaning with vapor degreaser or other solvents such as benzine, naphtha, thinner, etc. "Tide" or equal also recommended.

TYPICAL

ASTM SPECIFICATIONS

MET BY UNITS IN THIS CATALOG

Listed below and on the following pages are typical ASTM Specifications met by equipment in this catalog. Reference is simple. Specifications are tabularized alphabetically, then numerically. Numbers in ( ) after each specification designation are catalog pages of typical applicable equipment. For example: Specification D1110-56 (77) is met by the Gravity Ovens on pages 86/87. PLEASE NOTE: The letter S following the page number means the entire Series of units will meet the Standard. When the S does not appear, only certain models in the series will meet the Standard. Please contact the factory for the models which do apply if you are in doubt. The letter M following the page number indicates the unit will meet the Standard if modified somewhat. Again, please contact the factory for modifications required. The Specifications listed, current for the dates shown, may have been superseded in some cases since. If in doubt, please ask us to verify whether a given unit meets the Standard you have in mind.

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B70-56 (75) (144-147)
B84-70 (75) (108S)
B106-68 (72) (108)
B114-45 (75) (96S)
B196-78 (24-27)
B197-78 (24-27)
B223-56 (72) (96S, 108, 112S)
B267-77 (96S, 108)
B380-65 (72) (130, 134S)
B389-65 (75) (108S)
C4-62 (75) (24S)
C49-57 (74) (24-27)
C67-78 (24S)
C85-66 (73) (142S)
C92-76 (34S, 66S, 70-73S, 80-87S)
C97-47 (77) (24S)
C114-77 (46,142S)
C117-76 (34S, 50, 66S, 70-73S, 80-87S)
C120-52 (76) (24S)
C121-48 (76) (24S)
C126-71 (76) (34S, 66S, 70-73S, 80-87S)
C136-76 (50)
C140-75 (24S)
C142-78 (50)
C149-77 (112S)
C170-50 (76) (24S)
C179-72 (77) (24)
C186-78 (34S, 66S, 70-73S, 80-87S, 148)
C195-77 (24)
C196-77 (24)
C198-76 (24)
C199-72 (77) (24)
C203-58 (72) (34S, 66S, 70-73S, 80-87S)
C209-72 (26-31, 48)
C212-60 (75) (24S)
C217-58 (76) (24S)
C221-77 (24)
C225-73 (34S, 66S, 70-73S, 80-87S)
C241-51 (76) (24S)
C265-64 (76) (112S)
C267-77 (24S)
C271-61 (76) (50S)
C272-53 (76) (50S)
C279-54 (72) (34S, 66S, 70-73S, 80-87S)
C283-54 (72) (34S, 66S, 70-73S, 80-87S)

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C289-71 (76) (96S)
C295-65 (73) (50)
C301-78 (24S)
C321-77 (24)
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C331-77 (130)
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C354-73 (24)
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C419-65 (75) (34S, 66S, 70-73S, 80-87S)
C449-77 (24)
C457-71 (50)
C458-62 (77) (34S, 66S, 70-73S)
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C481-62 (76) (46S, 96S)
C484-66 (75) (24S)
C491-72 (77) (24S)
C492-66 (77) (24S, 128-137S)
C513-69 (76) (66, 70-87)
C531-74 (52S)
C534-77 (24S)
C553-70 (77) (137S)
C554-77 (24S)
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C566-67 (72) (30)
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C682-75 (112S)
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D228-69 (78) (50, 142S, 148S)
D233-65 (75) (112S)
D244-77 (64)
D280-75 (34S, 66S, 70-73S, 80-87S)
D297-77 (40S, 68-73S, 76S, 80-83S, 92-99S, 156SM, 162SM)
D301-72 (40S, 68-73S, 76S, 80-83S, 92-99S, 156SM, 162SM)
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D349-68 (72) (50S)
D350-70 (76) (24M, 34S, 66S, 70-73S, 80-87S)
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D422-63 (72) (106)
D460-78 (34S, 66S, 70-73S, 80-87S, 142S, 148S)
D461-77 (142S)
D470-75 (108S)
D482-74 (142S, 148S)
D494-46 (72) (34S, 66S, 70-73S, 80-87S)
D500-55 (75) (34S, 66S, 70-73S, 80-87S)
D501-67 (77) (34S, 66S, 70-73S, 80-87S)
D521-74 (34S, 66S, 70-73S, 80-87S)
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D548-41 (71) (34S, 66S, 70-73S, 80-87S, 108S)
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D559-57 (76) (34S, 66S, 70-73S, 80-87S)

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D578-78 (130)
D580-78 (44S)
D581-78 (44S)
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D586-63 (74) (142S, 148S)
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D639-72 (50)
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D729-57 (74) (52S, 108S)
D746-73 (112S)
D756-56 (71) (50S, 130)
D776-65 (71) (24S)
D786-49 (77) (50S)
D787-70 (76) (50S)
D793-49 (76) (108)
D800-58 (76) (142S, 148S)
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D856-49 (75) (142S, 148S)
D871-72 (24S, 142S, 148S)
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D873-74 (34S, 66S, 70-73S, 80-87S)
D874-77 (142S, 148S)
D879-62 (76) (96S, 112S)
D885-78 (50S)
D895-68 (73) (128, 137S)
D902-69 (74) (24S)
D914-72 (24S, 142S, 148S)
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D1000-76 (24S)
D1008-64 (77) (128-137S)
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D1047-74 (24S, 108S)
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D1056-77 (52S, 142S, 148S)
D1063-51 (75) (142S, 148S)
D1064-58 (75) (40S, 76S, 80-83S, 92-99S, 156S, 162S)
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D1102-56 (78) (142S, 148S)

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D1348-61 (74) (24S)
D1353-74 (36S, 66S, 70-73S, 80-87S)
D1363-67 (76) (112S)
D1370-58 (76) (50)
D1374-57 (76) (130, 136S)
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D1509-75 (34S, 66S, 70-73S, 80-87S)
D1510-76 (34S, 66S, 70-73S, 80-87S)
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D2450-75 (70-73S, 80-87S)
D2451-75 (70-73S, 80-87S)
D2453-75 (24S, 34S, 66S, 70-73S, 80-87S, 130S)
D2485-68 (73) (148S)
D2495-75 (50S)

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D2558-69 (77) (50S)
D2571-76 (24M)
D2579-78 (162S)
D2617-69 (74) (142S, 148S)
D2628-69 (76) (50)
D2646-69 (50S)
D2654-76 (50S)
D2671-74 (50S)
D2697-73 (34S, 66S, 70-73S, 80-87S)
D2718-76 (24)
D2742-73 (148S)
D2787-72 (77) (142S, 148S)
D2803-70 (74) (130)
D2822-75 (34S, 66S, 70-73S, 80-87S)
D2823-75 (34S, 66S, 70-73S, 80-87S)
D2824-76 (34S, 66S, 70-73S, 80-87S)
D2831-69 (74) (96)
D2834-72 (77) (50S)
D2857-70 (77) (108S)
D2866-70 (76) (50S, 142S, 148S)
D2867-70 (76) (50S)
D2875-70 (76) (142S, 148S)
D2876-70 (76) (24S, 96S)
D2893-72 (77) (96S)
D2895-73 (78) (24S)
D2907-75 (162S)
D2939-73 (64)
E30-77 (154, 156)
E31-75 (142S, 148S)
E36-76 (142S, 148S)
E38-76a (154, 156)
E54-76 (162S)
E69-50 (75) (34S, 66S, 70-73S, 80-87S)
E76-56 (78) (162S)
E96-66 (72) (130)
E154-68 (75) (34S, 66S, 70-73S, 80-87S)
E159-68 (74) (162S)
E160-50 (75) (34S, 66S, 70-73S, 80-87S)
E220-72 (108, 112S, 162S)
E223-68 (73) (142S, 148S)
E224-68 (73) (142S, 148S)
E257-67 (77) (34S, 66S, 70-73S, 80-87S, 142S, 148S)
E260-73 (34S, 66S, 70-73S, 80-87S)
E276-68 (74) (34S, 66S, 70-73S, 80-87S)
E291-71 (76) (142S, 148S)
E298-68 (73) (96S)
E347-71 (76) (142S, 148S)
E359-68 (73) (142S, 148S)
F5-60 (77) (142S)
F18-64 (77) (142S)
F60-68 (77) (70-73S)
F74-73 (50S)
F98-72 (77) (108S)
F135-76 (76M, 94)
G17-72 (50)

FAHRENHEIT TABLE OF RELATIVE HUMIDITY OR PER CENT OF SATURATION

Dry Bulb Deg. F.	Difference Between Readings of Wet and Dry Bulbs in Degrees Fahrenheit																															Dry Bulb Deg. F.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	22	24	26	28	30	32	34	36	38	40	45	50	55	60	70	
30	89	78	67	56	46	36	26	16	6	0	0																									30
35	91	81	72	63	54	45	36	27	19	10	2	0																								35
40	92	83	75	68	60	52	45	37	29	22	15	7	0	0																						40
45	93	86	78	71	64	57	51	44	38	31	25	18	12	6	0	0																				45
50	93	87	80	74	67	61	55	49	43	38	32	27	21	16	10	5	0	0																		50
55	94	88	82	76	70	65	59	54	49	43	38	33	28	23	19	14	9	5	0	0																55
60	94	89	83	78	73	68	63	58	53	48	43	39	34	35	26	21	17	13	9	5	0															60
65	95	90	85	80	75	70	66	61	56	52	48	44	39	35	31	27	24	20	16	12	5	0														65
70	95	90	86	81	77	72	68	64	59	55	51	48	44	40	36	33	29	25	22	19	12	6	0	0												70
75	96	91	86	82	78	74	70	66	62	58	54	51	47	44	40	37	34	30	27	24	18	12	7	1	0											75
80	96	91	87	83	79	75	72	68	64	61	57	54	50	47	44	41	38	35	32	29	23	18	12	7	3	0										80
85	96	92	88	84	80	76	73	70	66	63	59	56	53	50	47	44	41	38	35	32	27	22	17	13	8	4	0	0								85
90	96	92	89	85	81	78	74	71	68	65	61	58	55	52	49	47	44	41	39	36	31	26	22	17	13	9	5	1	0							90
95	96	93	89	85	82	79	75	72	69	66	63	60	57	54	52	49	46	43	42	38	34	30	25	21	17	13	9	6	2	0						95
100	96	93	89	86	83	80	77	73	70	68	65	62	59	56	54	51	49	46	44	41	37	33	28	24	21	17	13	10	7	4						100
102	96	93	89	86	83	80	77	74	71	69	65	62	59	57	54	52	49	47	45	43	38	34	30	26												102
104	96	93	90	86	83	80	77	74	71	69	65	63	60	58	55	52	50	48	46	43	39	35	31	27	23											104
106	96	93	90	87	83	80	77	74	72	69	66	63	60	58	56	53	51	48	46	44	40	36	32	28	24	21										106
108	96	93	90	87	84	81	78	75	72	70	66	64	61	59	56	54	51	49	47	45	41	37	33	29	26	22	19									108
110	96	93	90	87	84	81	78	75	72	70	67	64	62	60	57	55	52	50	48	46	41	37	34	30	27	23	20	17								110
112	96	93	90	87	84	81	78	75	73	70	67	65	62	60	57	55	53	51	49	47	42	38	35	31	28	24	21	18	15							112
114	97	93	90	87	84	81	78	75	73	71	68	65	63	61	58	56	53	51	49	47	43	39	35	32	28	25	22	19	16	13						114
116	97	93	90	88	84	82	79	76	74	71	68	66	63	61	59	56	54	52	50	48	44	40	36	33	29	26	24	20	17	14						116
118	97	93	91	88	85	82	79	76	74	71	68	66	64	62	59	57	54	53	51	49	44	41	37	34	30	27	24	21	19	15						118
120	97	94	91	88	85	82	79	77	74	72	69	66	64	62	60	57	55	53	51	49	45	41	38	34	31	28	25	22	19	16	10					120
122	97	94	91	88	85	82	79	77	75	72	69	67	65	63	60	58	56	54	52	50	46	42	38	35	32	29	26	23	20	17	12					122
124	97	94	91	88	85	83	80	77	75	72	70	67	65	63	61	58	56	54	52	51	46	43	39	36	33	29	27	24	21	18	13					124
126	97	94	91	88	86	83	80	78	75	73	70	68	65	64	61	59	57	55	53	51	47	43	40	37	33	30	28	25	22	19	14					126
128	97	94	91	89	86	83	80	78	76	73	71	68	66	64	61	59	57	55	53	52	47	44	40	37	34	31	28	25	23	20	15					128
130	97	94	91	89	86	83	80	78	76	73	71	68	66	64	62	60	58	56	54	52	48	44	41	38	35	32	29	26	24	21	15	10				130
132	97	94	92	89	86	83	81	78	76	74	71	69	67	65	62	60	58	56	54	53	49	45	42	39	35	32	30	27	24	22	16	11				132
134	97	94	92	89	86	84	81	79	76	74	71	69	67	65	63	61	59	57	55	53	49	46	42	39	36	33	31	28	25	23	17	12				134
136	97	94	92	89	86	84	81	79	77	74	72	69	67	65	63	61	59	57	55	53	50	46	43	40	37	34	31	28	26	24	18	13				136
138	97	94	92	89	86	84	81	79	77	74	72	70	68	66	63	62	60	58	56	54	50	47	43	40	37	35	32	29	27	24	19	14				138
140	97	94	92	89	87	84	81	79	77	75	72	70	68	66	64	62	60	58	56	54	51	47	44	41	38	35	33	30	27	25	19	14	10			140
142	97	94	92	89	87	84	82	80	77	75	73	70	68	66	64	62	60	58	57	55	51	48	44	42	39	36	33	30	28	26	20	15	11			142
144	97	95	92	89	87	84	82	80	78	75	73	71	69	67	65	63	61	59	57	55	52	48	45	42	39	36	34	31	29	26	21	16	11			144
146	97	95	92	90	87	85	82	80	78	75	73	71	69	67	65	63	61	59	57	56	52	49	45	43	40	37	35	32	29	27	21	17	12			146
148	97	95	92	90	87	85	82	80	78	76	73	71	69	67	65	63	61	60	58	56	53	49	46	43	40	38	35	32	30	28	22	17	13			148
150	98	95	92	90	87	85	82	80	78	76	74	72	70	68	66	64	62	60	58	57	53	49	46	43	41	38	36	33	30	28	23	18	13			150
152	98	95	93	90	88	85	83	81	79	76	74	72	70	68	66	64	62	60	59	57	53	50	47	44	41	39	36	33	31	29	23	19	14	10		152
154	98	95	93	90	88	85	83	81	79	77	74	72	70	68	66	65	63	61	59	57	54	50	47	44	42	39	37	34	32	29	24	19	15	11		154
156	98	95	93	90	88	85	83	81	79	77	74	72	71	69	67	65	63	61	59	58	54	51	48	45	42	40	37	34	32	30	24	20	15	11		156
158	98	95	93	90	88	86	83	81	79	77	75	73	71	69	67	65	63	61	60	58	55	51	48	45	43	40	38	35	33	30	25	20	16	12		158
160	98	95	93	90	88	86	83	81	79	77	75	73	71	69	67	65	64	62	60	58	55	52	49	46	43	41	38	35	33	31	25	21	17	13		160
162	98	95	93	90	88	86	84	82	80	77	75	73	71	69	68	66	64	62	60	59	55	52	49	46	44	41	39	36	34	31	26	22	17	13		162
164	98	95	93	91	88	86	84	82	80	78	75	73	72	70	68	66	64	62	61	59	56	52	49	47	44	41	39	36	34	32	26	22	18	14		164
166	98	95	93	91	88	86	84	82	80	78	76	74	72	70	68	66	65	63	61	59	56	53	50	47	44	42	39	37	35	32	27	23	18	14		166
168	98	95	93	91	88	86	84	82	80	78	76	74	72	70	68	67	65	63	61	60	56	53	50	47	45	42	40	37	35	33	28	23	19	15		168
170	98	95	93	91	89	86	84	82	80	78	76	74	72	70	69	67	65	63	62	60	57	53	51	48	45	43	40	38	35	33	28	24	19	15		170
172	98	95	93	91	89	86	84	82	81	78	76	74	73	71	69	67	66	64	62	60	57	54	51	48	46	43	41	38	36	34	28	24	20	16		172
174	98	95	93	91	89	87	84	83	81	78	76	75	73	71	69	67	66	64	62	61	57	54	51	49	46	43	41	39	36	34	29	24	20	16		174
176	98	96	94	91	89	87	85	83	81	79	77	75	73	71	70	68	66	64	63	61	58	55	52	49	46	44	42	39	37	35	29	25	21	17	10	176
178	98	96	94	91	89	87	85	83	81	79	77	75	73	72	70	68	66	64	63	61	58	55	52	49	47	44	42	39	37	35	30	25	21	17	11	178
180	98	96	94	91	89	87	85	83	81	79	77	75	73	72	70	68	67	65	63	62	58	55	52	50	47	45	42	40	38	35	30	26	22	18	11	180
182	98	96	94	91	89	87	85	83	81	79	77	75	74	72	70	68	67	65	63	62	59	56	53	50	48	45	43	40	38	36	31	26	22	18	12	182
184	98	96	94	92	89	87	85	83	82	79	77	76	74	72	70	69	67	65	64	62	59	56	53	50	48	45	43	41	38	36	31	27	22	19	12	184
186	98	96	94	92	90	87	85	83	82	80	78	76	74	72	71	69	67	66	64	62	59	56	53	51	48	46	43	41	39	37	32	27	23	19	13	186
188	98	96	94	92	90	87	85	84	82	80	78	76	74	73	71	69	68	66	64	63	59	57	54	51	49	46	44	41	39	37	32	27	23	20	13	188
190	98	96	94	92	90	88	85	84	82	80	78	76	75	73	71	69	68	66	65	63	60	57	54	51	49	46	44	42	39	37	32	28	24	20	14	190
200	98	96	94	92	90	88	86	84	82	80	79	77	75	74	72	70	69	67	66	64	61	58	55	53	51	48	46	43	41	39	34	30	26	22	16	200
205	98	96	94	92	90	88	86	84	83	81	79	77	76	74	72	71	69	68	66	65	62	59	56	54	51	49	46	44	42	40	35	31	27	23	17	205
210	98	96	94	93	90	88	87	85	83	81	80	78	76	75	73	71	70	68	67	65	62	60	57	54	52	49	47	45	43	41	36	32	28	24	18	210

BLUE M

CENTIGRADE TABLE OF RELATIVE HUMIDITY OR PER CENT OF SATURATION

Dry Bulb Deg. C.	Difference Between Readings of Wet and Dry Bulbs in Degrees Centigrade																													Dry Bulb Deg. C.
	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5	6	7	8	9	10	11	12	13	14	15	16	18	20	22	24	26	28	30	32	34	36	38	40	
2	92	83	75	67	59	52	43	36	27	20																							2
4	93	85	77	70	63	56	48	41	34	28	15																						4
6	94	87	80	73	66	60	54	47	41	35	23	11																					6
8	94	87	81	74	68	62	56	50	45	39	28	17																					8
10	94	88	82	76	71	65	60	54	49	44	34	23	14																				10
12	94	89	84	78	73	68	63	58	53	48	38	30	21	12	4																		12
14	95	90	84	79	74	69	65	00	55	51	41	33	24	16	10																		14
16	95	90	85	81	76	71	67	62	58	54	45	37	29	21	14	7																	16
18	95	90	86	82	78	73	69	65	61	57	49	42	35	27	20	13	6																18
20	96	91	87	82	78	74	70	66	62	58	51	44	36	30	23	17	11																20
22	96	92	87	83	79	75	72	68	64	60	53	46	40	34	27	21	16	11															22
24	96	92	88	85	81	77	74	70	66	63	56	49	43	37	31	26	21	14	10														24
26	96	92	89	85	81	77	74	71	67	64	57	51	45	39	34	28	23	18	13														26
28	96	92	89	85	82	78	75	72	68	65	59	53	47	42	37	31	26	21	17	13													28
30	96	93	89	86	82	79	76	73	70	67	61	55	50	44	39	35	30	24	20	16	12												30
32	96	93	90	86	83	80	77	74	71	68	62	56	51	46	41	36	32	27	23	19	15												32
34	97	93	90	87	84	81	77	74	71	69	63	58	53	48	43	38	34	30	26	22	18	10											34
36	97	93	90	87	84	81	78	75	72	70	64	59	54	50	45	41	36	32	28	24	21	13											36
38	97	94	90	87	84	81	79	76	73	70	65	60	56	51	46	42	38	34	30	26	23	16	10										38
40	97	94	91	88	85	82	79	76	74	71	66	61	57	52	48	44	40	36	32	29	25	19	13										40
42	97	94	91	88	85	82	80	77	74	72	67	62	58	53	49	45	41	38	34	31	27	21	15										42
44	97	94	91	88	86	83	80	77	75	73	68	63	59	54	50	47	43	39	36	32	29	23	17	12									44
46	97	94	91	89	86	83	81	78	76	73	68	64	60	55	52	48	44	41	37	34	31	25	19	14									46
48	97	94	92	89	86	84	81	78	76	74	69	65	61	56	53	49	45	42	39	35	33	27	21	16	12								48
50	97	94	92	89	87	84	82	79	77	75	70	65	62	57	54	50	47	43	40	37	34	28	23	18	14								50
52	97	94	92	89	87	84	82	79	77	75	70	66	62	58	55	51	48	44	41	38	35	30	25	20	16	11							52
54	97	95	92	90	87	85	82	80	78	76	71	67	63	59	56	52	49	45	42	39	36	31	26	21	17	13							54
56	97	95	92	90	87	85	83	80	78	76	72	68	64	60	57	53	50	46	43	40	38	32	27	23	19	15	11						56
58	97	95	93	90	88	85	83	80	79	77	72	68	64	61	57	54	51	47	44	42	39	33	29	24	20	16	12						58
60	98	95	93	90	88	86	83	81	79	77	73	69	65	62	58	55	52	48	45	43	40	35	30	26	21	18	14	11					60
62	98	95	93	91	88	86	84	81	79	78	73	69	66	62	59	56	53	49	46	43	41	36	31	27	23	19	15	12					62
64	98	95	93	91	88	86	84	82	80	78	74	70	66	63	59	56	53	50	47	44	42	37	32	28	24	20	17	13					64
66	98	95	93	91	89	86	84	82	80	78	74	70	67	64	60	57	54	51	48	45	43	38	33	29	25	21	18	15	12				66
68	98	95	93	91	89	87	85	82	81	79	75	71	67	64	61	58	55	52	49	46	44	39	34	30	26	22	19	16	13				68
70	98	96	93	91	89	87	85	83	81	79	75	71	68	65	61	58	55	52	50	47	44	40	35	31	27	23	20	17	14	11			70
72	98	96	94	92	89	87	85	83	81	80	76	72	69	65	62	59	56	53	50	48	45	40	36	32	28	24	21	18	15	12			72
74	98	96	94	92	90	87	85	83	82	80	76	72	69	66	63	60	57	54	51	48	46	41	37	33	29	25	22	19	16	13	11		74
76	98	96	94	92	90	88	86	84	82	80	76	73	70	66	63	60	57	54	52	49	47	42	38	34	30	26	23	20	17	14	12		76
78	98	96	94	92	90	88	86	84	82	81	77	73	70	67	64	61	58	55	52	50	47	43	38	34	30	27	24	21	18	15	13	10	78
80	98	96	94	92	90	88	86	84	83	81	77	74	71	67	64	61	58	56	53	50	48	43	39	35	31	28	24	22	19	16	14	11	80
82	98	96	94	92	90	88	86	84	83	81	77	74	71	68	65	62	59	56	54	51	49	44	40	36	32	29	25	22	20	17	15	12	10	82
84	98	96	94	92	90	88	86	85	83	81	78	74	71	68	65	62	59	57	54	52	49	45	40	37	33	29	26	23	20	18	16	13	11	84
86	98	96	94	92	91	89	87	85	83	82	78	75	72	69	66	63	60	57	55	52	50	45	41	37	34	30	27	24	21	19	16	14	12	86
88	98	96	95	93	91	89	87	85	83	82	78	75	72	69	66	63	60	58	55	53	51	46	42	38	34	31	28	25	22	19	17	15	13	88
90	98	97	95	93	91	89	87	85	84	82	79	76	73	69	67	64	61	58	56	53	51	47	42	39	35	32	28	26	23	20	18	16	14	90
92	98	97	95	93	91	89	87	86	84	82	79	76	73	70	67	64	61	59	56	54	52	47	43	39	36	32	29	26	24	21	19	16	14	92
94	99	97	95	93	91	89	88	86	84	83	79	76	73	70	67	65	62	59	57	54	52	48	44	40	36	33	30	27	24	22	19	17	15	94
96	99	97	95	93	91	90	88	86	84	83	80	76	74	70	68	65	62	60	57	55	53	48	44	41	37	34	31	28	25	22	20	18	16	96
98	99	97	95	93	92	90	88	86	85	83	80	77	74	71	68	65	63	60	58	55	53	49	45	41	38	34	31	28	26	23	21	19	16	98
100	99	97	95	93	92	90	88	86	85	83	80	77	74	71	68	66	63	60	58	56	54	49	45	42	38	35	32	29	26	24	22	19	17	100

HARPER CORROSION GUIDE

Reprinted courtesy the H. M. Harper Co.

NG (No Good) F (Fair) G (Good) E (Excellent)	Brass and Naval Bronze	Silicon Bronze	Monel Metal	Stainless Types 410, 416 and 430	Stainless Types 302 303, 304 and 305	Stainless Type 316	Copper	Aluminum
Acetate Solvents, Crude	F	G	G	G	E	E	G	E
Acetate Solvents, Pure	E	E	E	E	E	E	E	E
Acetate Acid, Crude	F(1)	G	G	NG(2)	G	E	G	G
Acetic Acid (Pure)	F(1)	G	G	NG(2)	G	E	G	E
Acetic Acid Vapors	NG	G	F	NG	G	E	G	G
Acetic Anhydride	NG	G	G	NG	G	E	G	E
Acetone	E	E	E	E	E	E	E	E
Acetylene	(3)	NG	G	E	E	E	NG	E
Alcohols	G	E	E	E	E	E	E	G
Aluminum Sulfate	F(1)	G	G	NG	F	G	G	F
Alums	F(1)	G	G	NG	F	G	G	E
Ammonia Gas (4)	NG(5) (6)	(6)	(6)	E	E	E	(6)	E
Ammonium Chloride	F(1)	G	E	F	F	E	G	NG
Ammonium Hydroxide	NG	NG	F	E	E	E	NG	G
Ammonium Nitrate	NG	F	F	E	E	E	F	E
Ammonium Phosphate (Ammoniacal)	NG	NG	G	E	E	E	NG	NG
Ammonium Phosphate (Neutral)	F	F	G	G	E	E	F	F
Ammonium Phosphate (Acid)	F(1)	F	G	F	G	E	F	F
Ammonium Sulfate	F(1)	F	G	G	E	E	F	G(35)
Asphalt	G	E	E	G	E	E	E	E
Beer	G	G	E	(7)	E	E	G	E
Beet Sugar Liquors	G	E	E	G	E	E	E	E
Benzene or Benzol (8)	E	E	E	E	E	E	E	E
Benzine (8)	E	E	E	E	E	E	E	E
Borax	G	G	E	E	E	E	G	G
Boric Acid	F(1)	G	E	F	G	E	G	E
Butane, Butylene, Bitadiene (9)	E(34)	E(34)	E	E(10)	E(10)	E(10)	E(34)	E
Calcium Bisulfite	NG	G	NG	NG	G	E	G	NG
Calcium Hypochlorite	F	F	F	NG	F	G	F	NG
Cane Sugar Liquors	G	E	E	G	E	E	E	E
Carbon Dioxide (Dry)	E	E	E	E	E	E	E	E
Carbon Dioxide (Wet) and (Aqueous Solution)	F(11)	G(11)	G(11)	E(11)	E	E	G(11)	E
Carbon Disulfide	F	NG	F	G	E	E	NG	G
Carbon Tetrachloride (12)	E	E	E	E	E	E	E	E

Footnotes to Corrosion Guide

(1) Subject to dezincification and/or stress corrosion; especially at elevated temperatures and with concentrated solutions.
(2) May be useful with cold dilute acid.
(3) Alloys up to 60% copper acceptable; high copper alloys unacceptable.
(4) At temperatures below that at which gas liberates nascent nitrogen.
(5) Subject to stress corrosion with low concentrations.
(6) Apparently resistant to dry gas at ordinary temperatures; attacked rapidly by moist gas and by hot gas.
(7) Not recommended for use with beverage grade.
(8) Chemicals used for treating in manufacture assumed to be absent.
(9) Temperature assumed to be no higher than that normally encountered in compression, storage and distribution.
(10) Useful at elevated temperatures.
(11) Not recommended for use with carbonated beverages.
(12) Water assumed to be absent.
(13) Not recommended for use with edible grades.
(14) Only with dilute or unaerated solutions.
(15) Subject to stress corrosion by moist gas; and to severe general corrosion by saturated aqueous solution.
(16) Subject to stress corrosion.
(17) None of these materials recommended for use with nickel plating solutions.
(18) Higher chromium alloys (over 18%) preferred.
(19) Not recommended for temperatures over 100° C (212° F).
(20) Alloys with less than 18% Cr. not recommended for temperatures over 100° C (212° F). Others not recommended for temperatures over 200° C (390° F).
(21) Up to 60° C (140° F).
(22) Up to 90° C (200° F).
(23) At room temperature.
(24) Not recommended for temperatures over 200° C (390° F).
(25) Non-ferrous alloys preferred when unaerated and at temperatures above normal. Stainless Steel best when aerated and at moderate temperatures.
(26) With cold acid only.
(27) In the absence of exposure to moist air.
(28) Crude product may contain acids which corrode these materials.
(29) Some ratings may not apply at elevated temperatures (200° C) (390° F).
(30) Dissolved oxidizing salts; without, good; with, fair.
(31) Dissolved oxidizing salts; with, excellent; without, n. g.
(32) Subject to dezincification with hot and/or aerated waters.
(33) Subject to pitting attack.
(34) Copper may act as a catalyst for undesirable reactions.
(35) Free sulphuric acid absent.

BLUE M

HARPER CORROSION GUIDE

Reprinted courtesy the H. M. Harper Co.

NG (No Good) F (Fair) G (Good) E (Excellent)	Brass and Naval Bronze	Silicon Bronze	Monel Metal	Stainless Types 410, 416 and 430	Stainless Types 302 303, 304 and 305	Stainless Type 316	Copper	Aluminum
Chlorine (Dry)	G	G	E	G	G	G	G	NG
Chlorine (Wet)	NG	F	F	NG	NG	F	F	NG
Chromic Acid	NG	NG	F	F	G	E	NG	NG
Citric Acid	F(1)	G	G	F	G	E	G	G
Coke Oven Gas	F	F	G	E	E	E	F	G
Copper Sulfate	NG	F	F	E	E	E	F	NG
Core Oils	E	E	E	E	E	E	E	E
Cottonseed Oil	E	E	E	E	E	E	E	E
Creosote	F	G	E	E	E	E	G	G
Ethers	E	E	E	E	E	E	E	E
Ethylene Glycol	G	E	E	E	E	E	E	G
Ferric Chloride	NG	NG	NG	NG	NG	NG	NG	NG
Ferric Sulfate	NG	F	F	E	E	E	F	G
Formaldehyde	G	G	E	E	E	E	G	G
Formic Acid	F(1)	G	G	NG(2)	G	E	G	NG
Freon	E	E	E	E	E	E	E	G
Furfural	G	G	E	E	E	E	G	E
Gasoline (Sour)	F	NG	NG	F	E	E	NG	NG
Gasoline (Refined)	E	E	E	E	E	E	E	E
Gelatine	F(13)	E(13)	E	F(13)	E	E	E(13)	E
Glucose	E	E	E	E	E	E	E	E
Glue	F	E	E	E	E	E	E	F
Glycerine or Glycerol	G	E	E	E	E	E	E	E
Hydrochloric Acid	NG	F(14)	F(14)	NG	NG	NG	F(14)	NG
Hydrocyanic Acid (Hydrogen Cyanide)	NG	NG	G	F	E	E	NG	E
Hydrofluoric Acid	NG	F	E	NG	NG	NG	F	NG
Hydrogen Fluoride	F	G	E	F	G	G	G	NG
Hydrogen (9)	E	E	E	E	E	E	E	E
Hydrogen Peroxide	NG	F	G	E	E	E	F	G
Hydrogen Sulfide (Dry)	F(6)	NG(6)	F(6)	G	E	E	NG(6)	E
Hydrogen Sulfide (Wet and Aqueous Solution)	F	NG	F	F(15)	G	E	NG	E
Lacquers and Lacquer Solvents	F	E	E	E	E	E	E	E
Lime-Sulfur	NG	F	G	G	E	E	F	NG
Magnesium Chloride	F	G	E	F	G	E	G	NG
Magnesium Hydroxide	G	E	E	E	E	E	E	F
Magnesium Sulfate	G	E	E	E	E	E	E	G

Numeral refer to footnotes on Page 186

HARPER CORROSION GUIDE

Reprinted courtesy the H. M. Harper Co.

NG (No Good) F (Fair) G (Good) E (Excellent)	Brass and Naval Bronze	Silicon Bronze	Monel Metal	Stainless Types 410, 416 and 430	Stainless Types 302, 303, 304 and 305	Stainless Type 316	Copper	Aluminum
Mercuric Chloride	NG	NG	NG	NG	NG	F(16)	NG	NG
Mecury	NG	NG	G	E	E	E	NG	NG
Milk	F	F	F	G	E	E	F	E
Molasses	G	E	E	G	E	E	E	E
Natural Gas	G	E	E	E	E	E	E	E
Nickel Chloride (17)	NG	F	G	NG	F	G	F	NG
Nickel Sulfate (17)	F	G	E	F	G	E	G	NG
Nitric Acid	NG	NG	NG	G(18)	G	G	NG	F
Oleic Acid	F(19)	G(24)	E	G(20)	G(20)	E	G(24)	E
Oxalic Acid	F(1)	G	E	F	G	E	G	NG
Oxygen (9)	E	E	E	E	E	E	E	E
Palmitic Acid	F(19)	G(24)	E	G(20)	G(20)	E	G(24)	E
Petroleum Oils (Sour)	F	NG	NG	F	E	E	NG	NG
Petroleum Oils (Refined)	E	E	E	E	E	E	E	E
Phosphoric Acid 25%	NG	G(21)	G(22)	NG	F(23)	E	G(21)	NG
Phosphoric Acid 25%, 50%	NG	G(21)	G(22)	NG	NG	G	G(21)	NG
Phosphoric Acid 50%, 85%	NG	G(21)	G(22)	NG	NG	G	G(21)	E
Picric Acid	NG	NG	NG	G	E	E	NG	F
Potassium Chloride	F	G	E	F	G	E	G	NG
Potassium Hydroxide	NG	F	E	E	E	E	F	NG
Potassium Sulfate	G	E	E	E	E	E	E	E
Propane (9)	E	E	E	E(10)	E(10)	E(10)	E	E
Rosin (Dark)	G	G	E	E	E	E	G	E
Rosin (Light)	NG	NG	G	E	E	E	NG	G
Shellac	G	E	E	E	E	E	E	E
Soda Ash (Sodium Carbonate)	G	G	E	E	E	E	E	NG
Sodium Bicarbonate	E	E	E	E	E	E	E	G
Sodium Bisulfate	F(1)	G	E	NG	NG	E	G	F
Sodium Chloride	F	G	E	F	G	E	G	G
Sodium Cyanide	NG	NG	G	E	E	E	NG	NG
Sodium Hydroxide	NG	F	E	E	E	E	F	NG
Sodium Hypochlorite	NG	F	F	NG	F	G	F	NG
Sodium Metaphosphate	F	G	E	G	E	E	G	F
Sodium Nitrate	F	G	E	E	E	E	G	E
Sodium Perborate	F	G	E	E	E	E	G	F
Sodium Peroxide	F	G	E	E	E	E	G	F

Numeral refer to footnotes on Page 186

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HARPER CORROSION GUIDE

Reprinted courtesy the H. M. Harper Co.

NG (No Good) F (Fair) G (Good) E (Excellent)	Brass and Naval Bronze	Silicon Bronze	Monel Metal	Stainless Types 410, 416 and 430	Stainless Types 302, 303, 304 and 305	Stainless Type 316	Copper	Aluminum
Sodium Phosphate (Alkaline)	F	G	E	E	E	E	G	NG
Sodium Phosphate (Neutral)	G	E	E	E	E	E	E	NG
Sodium Phosphate (Acid)	F(1)	G	E	NG	G	E	G	NG
Sodium Silicate	F	G	E	E	E	E	G	G
Sodium Sulfate	G	E	E	E	E	E	E	E
Sodium Sulfide	NG	NG	G	E	E	E	NG	NG
Sodium Thiosulfate (Hypo)	NG	NG	G	E	E	E	NG	E
Sludge Acid	NG	G	G	NG	NG	F	G	NG
Stearic Acid	F(19)	G(24)	E	G(20)	G(20)	E	G(24)	E
Sulfate Liquors	NG	NG	G	E	E	E	NG	NG
Sulfur	F	F	F	E	E	E	F	E
Sulfur Chloride	NG	NG	G	NG	F	G	NG	NG
Sulfur Dioxide (Dry) (9)	F	E	E	E	E	E	E	G
Sulfur Dioxide (Wet)	NG	G	NG	NG	G	E	G	F
Sulfuric Acid 10%	NG	G(25)	G(25)	NG	NG	G(25)	G	NG
Sulfuric Acid 10%, 75%	NG	F	G	NG	NG	NG	F	NG
Sulfuric Acid 75%, 95%	NG	F(26)	F(26)	F(27)	F(27)	G(27)	F(26)	NG
Sulfuric Acid 95%	NG	F	NG	G	G	G	NG	F
Sulfurous Acid	NG	G	NG	NG	F	G	G	NG
Tar	G	E	E	G	E	E	E	E
Tartaric Acid	F(1)	G	G	F	G	E	G	G
Toluene or Toluol (8)	E	E	E	E	E	E	E	E
Trichloroethylene (12)	E	E	E	E	E	E	E	E
Turpentine	F(28)	E	E	G(28)	E	E	E	E
Varnish (29)	G	G	E	E	E	E	G	E
Vegetable Oils (29)	G	G	E	E	E	E	G	E
Vinegar (25)	NG	G	G	F	G	E	G	E
Water (Acid Mine Water)	NG	(30)	(30)	(31)	(31)	(31)	(30)	F
Water (Fresh)	F(32)	G	E	E	E	E	G	E
Water (Salt)	F(32)	G	E	F(33)	G(33)	G(33)	G	G
Whiskey	G	G	G	F	E	E	G	F
Wines	G	G	G	F	E	E	G	F
Xylene or Xylol (8)	E	E	E	E	E	E	E	E
Zinc Chloride	NG	G	E	NG	NG	G	G	NG
Zinc Sulfate	F	G	E	F	G	E	G	G

Numeral refer to footnotes on Page 186

Interrelation of Units of Measurement
Conversion Tables

Conversion Table Millimeter and Inch

Mm.	Inches
1	0.03937
2	0.07874
3	0.11811
4	0.15748
5	0.19685
6	0.23622
7	0.27559
8	0.31496
9	0.35433
10	0.39370
11	0.43307
12	0.47244
13	0.51181
14	0.55118
15	0.59055
16	0.62992
17	0.66929
18	0.70866

Mm.	Inches
19	0.74803
20	0.78740
21	0.82677
22	0.86614
23	0.90551
24	0.94488
25	0.98425
25.4	1.0
38.1	1.5
50.0	1.968
50.8	2.0
75.0	2.953
76.2	3.0
100.0	3.937
101.6	4.0
127.0	5.0
152.4	6.0

Units of Mass

Unit	Grains	Avoirdupois Ounces	Avoirdupois Pounds	Grams
Grain	1	0.00229	0.000143	0.064799
Apoth. Scruple	20	0.04571	0.002857	1.29598
Pennyweight	24	0.05486	0.00343	1.55517
Avdp. Dram	27.344	0.0625	0.003906	1.77185
Apoth. Dram	60	0.1371	0.008571	3.88794
Avdp. Ounce	437.5	1	0.0625	28.3495
Apoth. Ounce	480	1.09714	0.068571	31.1035
Apoth. Pound	5760	13.1657	0.822857	373.242
Avdp. Pound	7000	16	1	453.592
Gram	15.432	0.03527	0.002205	1
Kilogram	15432	35.2739	2.20462	1000
Short Ton	.....	.....	2000	.....
Long Ton	.....	.....	2240	.....
Metric Ton	.....	.....	2204.6	.....

Units of Capacity, Liquid Measure

Unit	Fluid Drams	Fluid Ounces	Quarts	Gallons	Liters
Fl. Dram	1	0.125	0.003906	0.000976	0.003686
Fl. Ounce	8	1	0.03125	0.007812	0.029573
Quart	256	32	1	0.25	0.94633
Gallon	1024	128	4	1	3.78533
Milliliter	0.2705	0.03381	0.001057	0.000264	0.001
Liter	270.518	33.8147	1.05671	0.264178	1
Cubic Inch	4.432	0.5541	0.017316	0.004329	0.016387

Equivalents of Fractions of an Inch in Decimal Inches and Millimeters

Fraction Inches	Decimal Inches	Millimeters
1/64	0.015625	0.397
1/32	0.03125	0.794
3/64	0.046875	1.191
1/16	0.0625	1.588
5/64	0.078125	1.984
3/32	0.09375	2.381
1/8	0.125	3.175
3/16	0.1875	4.763
1/4	0.25	6.35
5/16	0.3125	7.938
3/8	0.375	9.525
7/16	0.4375	11.113
1/2	0.50	12.70
9/16	0.5625	14.288
5/8	0.625	15.875
11/16	0.6875	17.463
3/4	0.75	19.05
13/16	0.8125	20.638
7/8	0.875	22.225
15/16	0.9375	23.813
1	1.0	25.40

Units of Area

Unit	Square Inches	Square Feet	Square Yards	Square Centimeters	Square Meters
Sq. Inch	1	0.006944	0.000772	6.45162	0.000645
Sq. Foot	144	1	0.11111	929.034	0.092903
Sq. Yard	1296	9	1	8361.31	0.836131
Sq. Cm.	0.155	0.001076	0.00012	1	0.0001
Sq. Meter	1550	10.7639	1.19598	10000	1

Units of Length

Unit	Inches	Feet	Yards	Centimeters	Meters
Inch	1	0.08333	0.02777	2.54	0.0254
Foot	12	1	0.3333	30.48	0.3048
Yard	36	3	1	91.44	0.9144
Mile	63360	5280	1760	160934	1609.34
Cm.	0.3937	0.03281	0.01094	1	0.01
Meter	39.37	3.3808	1.09361	100	1

Units of Volume

Unit	Cubic Inches	Cubic Feet	Cubic Yards	Cubic Centimeters
Cubic Inch	1	.....	.....	16.3872
Cubic Foot	1728	1	0.03704	28317
Cubic Yard	46656	27	1	764.559
Cubic Cm.	0.06102	.....	.....	1
Cubic Meter	61023	35.314	1.3079	1000000

BLUE M

Temperature Conversion Table

Adapted from table compiled by Dr. Albert Sauveur. The **boldface numbers** in the center columns represent the temperature in Centigrade or Fahrenheit degrees that it is desired to convert from one system into the other. The equivalent Fahrenheit temperature is found in the right-hand column, and the equivalent Centigrade temperature in the left-hand column.

C°		F°	C°		F°	C°		F°	C°		F°
—268	—450		0	**32**	89.6	25.6	**78**	172.4	166	**330**	626
—240	—400		0.56	**33**	91.4	26.1	**79**	174.2	171	**340**	644
—212	—350		1.11	**34**	93.2	26.7	**80**	176.0	177	**350**	662
—184	—300		1.67	**35**	95.0	27.2	**81**	177.8	182	**360**	680
—169	—273	—459.4	2.22	**36**	96.8	27.8	**82**	179.6	188	**370**	698
—157	—250	—418	2.78	**37**	98.6	28.3	**83**	181.4	193	**380**	716
—129	—200	—328	3.33	**38**	100.4	28.9	**84**	183.2	199	**390**	734
—101	—150	—238	3.89	**39**	102.2	29.4	**85**	185.0	204	**400**	752
— 73.3	—100	—148	4.44	**40**	104.0	30.0	**86**	186.8	210	**410**	770
— 45.6	— 50	— 58	5.00	**41**	105.8	30.6	**87**	188.6	216	**420**	788
— 40.0	— 40	— 40	5.56	**42**	107.6	31.1	**88**	190.4	221	**430**	806
— 34.4	— 30	— 22	6.11	**43**	109.4	31.7	**89**	192.2	227	**440**	824
— 28.9	— 20	— 4	6.67	**44**	111.2	32.2	**90**	194.0	232	**450**	842
— 23.3	— 10	14	7.22	**45**	113.0	32.8	**91**	195.8	238	**460**	860
— 17.8	0	32	7.78	**46**	114.8	33.3	**92**	197.6	243	**470**	878
— 17.2	1	33.8	8.33	**47**	116.6	33.9	**93**	199.4	249	**480**	896
— 16.7	2	35.6	8.89	**48**	118.4	34.4	**94**	201.2	254	**490**	914
— 16.1	3	37.4	9.44	**49**	120.2	35.0	**95**	203.0	260	**500**	932
— 15.6	4	39.2	10.0	**50**	122.0	35.6	**96**	204.8	288	**550**	1022
— 15.0	5	41.0	10.6	**51**	123.8	36.1	**97**	206.6	316	**600**	1112
— 14.4	6	42.8	11.1	**52**	125.6	36.7	**98**	208.4	343	**650**	1202
— 13.9	7	44.6	11.7	**53**	127.4	37.2	**99**	210.2	371	**700**	1292
— 13.3	8	46.4	12.2	**54**	129.2	37.8	**100**	212.0	399	**750**	1382
— 12.8	9	48.2	12.8	**55**	131.0	43	**110**	230	427	**800**	1472
— 12.2	10	50.0	13.3	**56**	132.8	49	**120**	248	454	**850**	1562
— 11.7	11	51.8	13.9	**57**	134.6	54	**130**	266	482	**900**	1652
— 11.1	12	53.6	14.4	**58**	136.4	60	**140**	284	538	**1000**	1832
— 10.6	13	55.4	15.0	**59**	138.2	66	**150**	302	593	**1100**	2012
— 10.0	14	57.2	15.6	**60**	140.0	71	**160**	320	649	**1200**	2192
— 9.44	15	59.0	16.1	**61**	141.8	77	**170**	338	704	**1300**	2372
— 8.89	16	60.8	16.7	**62**	143.6	82	**180**	356	760	**1400**	2552
— 8.33	17	62.6	17.2	**63**	145.4	88	**190**	374	816	**1500**	2732
— 7.78	18	64.4	17.8	**64**	147.2	93	**200**	392	871	**1600**	2912
— 7.22	19	66.2	18.3	**65**	149.0	99	**210**	410	927	**1700**	3092
— 6.67	20	68.0	18.9	**66**	150.8	100	**212**	413	982	**1800**	3272
— 6.11	21	69.8	19.4	**67**	152.6	104	**220**	428	1038	**1900**	3452
— 5.56	22	71.6	20.0	**68**	154.4	110	**230**	446	1093	**2000**	3632
— 5.00	23	73.4	20.6	**69**	156.2	116	**240**	464	1149	**2100**	3812
— 4.44	24	75.2	21.1	**70**	158.0	121	**250**	482	1204	**2200**	3992
— 3.89	25	77.0	21.7	**71**	159.8	127	**260**	500	1260	**2300**	4172
— 3.33	26	78.8	22.2	**72**	161.6	132	**270**	518	1316	**2400**	4352
— 2.78	27	80.6	22.8	**73**	163.4	138	**280**	536	1371	**2500**	4532
— 2.22	28	82.4	23.3	**74**	165.2	143	**290**	554	1427	**2600**	4712
— 1.67	29	84.2	23.9	**75**	167.0	149	**300**	572	1482	**2700**	4892
— 1.11	30	86.0	24.4	**76**	168.8	154	**310**	590	1538	**2800**	5072
— 0.56	31	87.8	25.0	**77**	170.6	160	**320**	608	1593	**2900**	5252

Interpolation Factors

C°		F°	C°		F°
0.56	**1**	1.8	3.33	**6**	10.8
1.11	**2**	3.6	3.89	**7**	12.6
1.67	**3**	5.4	4.44	**8**	14.4
2.22	**4**	7.2	5.00	**9**	16.2
2.78	**5**	9.0	5.56	**10**	18.0

BLUE M GENERAL INFORMATION TERMS, AND CONDITIONS OF SALE

IMPROVEMENTS
Being a progressive company, we are constantly striving to improve our products. Thus, we reserve the right to offer improved models. All improved models will be equal to, or better than the original item, in our judgement.

DELIVERY AND STOCK
In most cases, all units listed in the Catalog are in stock and delivery can be effected within the same day order is received. We stock hundreds of ovens and furnaces to serve you better. Wire or telephone the factory or your distributor for delivery information.

SHIPMENTS
If specific shipping instructions are not given as to the method of shipping, we will determine the method which, in our judgement, will be the best for our customer.

BOXING AND PACKING
All prices shown include cost for cartons, boxes, and packing for domestic shipments. Domestic boxing is usually suitable for export shipments by air. For overseas shipment by ocean freight, an extra nominal charge is made for such packing.

SHIPPING WEIGHTS
Shipping weights are shown for each model. Every effort is made to reduce shipping weights in keeping with good shipping practice.

PRICES
All prices shown are current and f.o.b. our Blue Island factory unless otherwise noted. We reserve the right to increase or decrease our prices. Proper notice will be issued in either case.

TERMS OF PAYMENTS
Net thirty days for all customers in U.S. and Canada after credit responsibility is established with us. For customers in other countries, we require — for the present — an irrevocable banker's Letter of Credit, preferably through a Chicago or New York bank, against which we can draw at time of shipment.

ENGINEERING SERVICE
A complete staff of competent engineers and expert mechanics are available to facilitate the design and manufacture of units to meet special applications. Prompt and courteous service extended at all times.

SPECIAL UNITS
Many customers desire modifications of standard units and/or special units designed to fit their particular application. Blue M Electric Company is well equipped to engineer and serve these needs. However, orders for modified units and/or special units are not subject to cancellation except with our consent and upon payment of reasonable charges which will indemnify us from any expenses incurred and commitments made by Blue M Electric Company.

MATERIAL CHANGES
Substituting materials due to existing conditions are sometimes necessary. We adhere to specifications shown in the Catalog. However, when substitutes are made, careful selections assure you of the best materials available for that particular application.

EXCEPTIONAL WARRANTY
For details on Blue M's unique General Parts Warranty and Replacement Service Program, please see Catalog page 16.

LOSS, DAMAGE, SHORTAGES, OR DELAY
Blue M Electric Company shall not be liable for loss, damage, detention or delay resulting from causes beyond its reasonable control or caused by fire, work stoppage, civil or military authority, restrictions of the United States Government or any department, branch, or representative thereof, insurrection or riot, embargoes, car shortages, wrecks or delays in transportation, or inability to obtain necessary labor, materials, or manufacturing facilities due to such causes. Receipt of the equipment by the purchaser upon its delivery shall constitute a waiver of all claims for delay. All damages must be reported immediately by telephone, wire or letter. Shortages in shipment must be made within 10 days of receipt of materials. Non-receipt of shipments must be reported within 10 days after receipt of invoices.

RETURNING OF EQUIPMENT
Authorization and shipping instructions for the return of any equipment or parts must be obtained by the purchaser from Blue M Electric Company offices **before** returning the equipment. Equipment must be returned with complete identification in accordance with our return authorization instructions or it will not be accepted. If a purchaser requests authorization to return equipment for reasons of his own, a restocking charge will be made plus all incoming and outgoing transportation charges paid by Blue M Electric Company.

REPAIR CHARGES
No charges for repair, replacement, etc., will be honored except when made with our written permission.

CONSEQUENTIAL DAMAGES
In no event shall Blue M Electric Company or any of its divisions be liable for consequential damages.

TAXES
The price does not include any state or local property, sales, use or privilege taxes, or any state or local taxes in lieu of the foregoing; and since any one or all of such may now or hereafter be applicable to, measured by or imposed upon the property, its sale, its value or its use, as contemplated in this offer (bid), or a contract pursuant thereto and/or the execution thereof, purchaser agrees to pay or reimburse any such taxes which Blue M Electric Company or distributors are required to pay.

AMENDMENT OF TERMS
The above terms and condition of sales are subject to withdrawal or change at any time by amendment or issuance of a new letter or policy.

WE MAINTAIN PRICES WHENEVER POSSIBLE . . .
We list many accessories which we buy, inspect and stock for your convenience
Unfortunately, we have no control over prices established by our suppliers. In many cases, prices are increased to us with little or no advance notice
Accordingly, we are forced to repeat the familiar phrase, "PRICES SUBJECT TO CHANGE WITHOUT NOTICE"
Firm quotations, however, will be made immediately when required.

LOOK FOR
BLUE M
ADVERTISEMENTS
IN ALL LEADING PUBLICATIONS

BLUE M ELECTRIC COMPANY IS A MEMBER IN GOOD STANDING WITH

1. **American Society for Testing Materials (ASTM)**
2. **Chicago Association of Commerce and Industry (CACI)**
3. **Illinois Manufacturer's Association (IMA)**
4. **Illinois State Chamber of Commerce (ISCC)**
5. **Institute of Electrical and Electronic Engineers (IEEE)**
6. **Institute of Environmental Sciences (IES)**
7. **Scientific Apparatus Makers Association (SAMA)**
8. **Blue Island Chamber of Commerce (BICC)**
9. **National Oceanography Association (NOA)**
10. **Semiconductor Equipment and Materials Institute (SEMI)**

BLUE M

BLUE M *Electric Company*

CORPORATE HDQRS: BLUE ISLAND, IL 60406
AREA CODE 312; PHONES: FUlton 5-9000
• INterocean 8-7755 • TWX 910-689-3398

QUOTATIONS/BLUE PRINTS/TECHNICAL INFORMATION/SERVICE - AVAILABLE UPON REQUEST . . .
If, after looking through our Catalog, you cannot find a unit to meet your requirements, Blue M has a capable engineering staff, anxious to assist you. Quotations, certified blueprints, technical information are all available at no charge or obligation. Be assured your inquires, as well as orders, will receive our prompt and careful attention. We look forward to being of service to you

LOOK FOR
BLUE M
DISPLAYS
AT LEADING EXPOSITIONS
THROUGHOUT THE NATION

POWER-O-MATIC 60®
PATENTED
SCIENTIFIC AND LABORATORY OVENS

POWER-O-MATIC 70®
PATENTED
SOLID-STATE PROPORTIONING CONTROL SYSTEM

POWER-O-MATIC 80®
PATENTED
SOLID-STATE PROPORTIONING CONTROL SYSTEM

POWER-O-MATIC 90®
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NON-ELECTRIC PROPORTIONING CONTROL SYSTEM

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